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BASIC DATA ON TRAFFIC–1961

BILLINGS METROPOLITAN AREA TRANSPORTATION STUDY

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BILLINGS METROPOLITAN AREA TRANSPORTATION STUDY

BASIC DATA ON TRAFFIC--1961

Prepared for

THE STATE HIGHWAY COMMISSION
OF THE STATE OF MONTANA AND
THE CITY OF BILLINGS
In Cooperation with
THE U.S. DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

702

FEBRUARY 1963

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DE LEUW, CATHER & COMPANY
ENGINEERS
165 WEST WACKER DRIVE
CHICAGO 1
FINANCIAL 6-0424

February 28, 1963

The State Highway Commission
of the State of Montana
Helena, Montana

Gentlemen:

We take pleasure in submitting this report presenting Basic Data on Traffic obtained through the comprehensive transportation study made in the Billings, Montana, Metropolitan Area in August, September and October 1961. Summary tables related to the parking study made at the same time have been submitted previously. Expansion of the traffic data as well as analyses of both the traffic and parking studies and recommendations with respect to future improvements will be presented in subsequent reports.

This report consists of basic tables and statistical data obtained in the internal and external origin-destination surveys. Specifically, the tables included are: "A" Tables--screen line and cordon line comparisons; "B" Tables--dwelling unit statistics, trip purposes and vehicle occupancy; "C" Tables--zone-to-zone auto trips from both internal and external surveys, together with zone-to-zone passenger trips from the internal survey; "D" Table--zone-to-zone truck trips; "E" Table--summary of zone-to-zone vehicle trips; and "F" Tables--type of parking related to purpose of trip.

We wish to acknowledge the cooperation of many individuals representing both governmental and private agencies. We also appreciate the wholehearted cooperation extended by the general public during the process of the surveys.

We believe that the information gathered and herein summarized will provide a sound basis for analyses of future improvements in the Billings Metropolitan Area.

Very truly yours,

DE LEUW, CATHER & COMPANY
Walter A Barry Jr
Walter A. Barry, Jr.
Chief Traffic and Transit Engineer

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BASIC DATA ON TRAFFIC

This report presents data acquired through a comprehensive transportation study made in the Billings Metropolitan Area during August, September and October 1961. The results of a parking study made during the same period have already been described in a previous report. Analysis and expansion of survey data, as well as conclusions and recommendations regarding future traffic improvements will be presented in subsequent reports.

Description of the Study Area

The study area was determined by field inspection and selected to include the entire Billings Metropolitan Area with the exception of Billings Heights and Lockwood. The study area was bounded on the north by a line paralleling the rim rocks and including the airport; on the east and south by the Yellowstone River; and on the west by the Big Ditch and a line east of 40th Street West. See Exhibit 2. This area will subsequently be referred to as the internal survey area. The boundary of the internal survey area has been designated the external cordon line.

The internal survey area was divided into sectors, districts and zones for later use in analysis of origin-destination data. A three digit code was used--the first digit being the sector number; the second, the district number; and the third, the zone number. Zone boundaries were drawn to include areas of similar land use and size, in terms of population. Zones nearest the center of the city--where population was most dense--were smaller in area, therefore, than those in outlying sections. Exhibit 2 shows the definition of zones in the internal survey area. Exhibit 1 shows an enlargement of zones in the central business district. (Block numbers in the central business district, shown in Exhibit 1, are actually subzone numbers and correspond to those used in the parking survey.)

In a similar manner, areas outside of the internal survey area were divided into sectors, districts and zones. Yellowstone County was designated "Sector 6"and subdivided as shown in Exhibit 3. Sectors 7 and 8 included each of the remaining counties in Montana (See Exhibit 4) and the remainder of the United States, Canada and Mexico were subdivided as shown in Exhibit 5.

Survey Procedures

The survey was accomplished in accordance with methods described in the "Manual of Procedures for Home Interview Traffic Study", published by the Department of Commerce, Bureau of Public Roads. The study consisted of two major phases--the internal and external surveys.

THE INTERNAL SURVEY

The internal survey included home interviews with a representative sample of persons residing in the area, together with interviews with truck and taxi operators. All interviews pertained to trips made during a 24-hour period on a normal weekday.

Sampling Procedures

Travel patterns of residents of the internal area (except truck and taxi operators) were obtained by interviewing the occupants of a statistically selected sample of dwelling units. One-sixth of all dwelling units within the area were selected for home interviews.

In sections of the metropolitan area for which Sanborn maps were available, dwelling unit samples were selected through use of the Sanborn maps and the City Directory. In areas which were not covered by Sanborn maps, or those which had changed substantially since preparation of the maps, the sample was selected in the field.

In areas covered by Sanborn maps, samplers recorded the address of each sixth dwelling unit on forms later used by interviewers. The addresses of adjacent houses (or apartments) were also recorded to facilitate representative sampling of new dwelling units not indicated on the Sanborn maps. Interviewers were instructed to contact the residents of the dwelling unit indicated as well as any others between that address and the subsequent address shown on the form. Similarly, if the dwelling unit selected was found to be demolished or vacant, this was noted on the interview form to provide an indication of the total number of such dwelling units in the survey area. Interviewers were not permitted to substitute one dwelling unit for another. If the interview could not be made for some valid reason (i. e. sickness or refusal to cooperate), the interview was returned incomplete and this was taken into account in subsequent expansion of the data.

In areas not covered by Sanborn maps, address of each sixth dwelling unit was recorded by visual inspection in the field. Field samplers endeavored to determine the total number of dwelling units in each building through inspection of mail boxes, utility meters, or by questioning residents of the area. While it was unnecessary to record the addresses of adjacent houses (since new or demolished buildings were obvious to the field canvassers), interviewers were instructed to visit each additional dwelling unit found at the address selected by the sampler. The same instructions were also given interviewers visiting dwelling units selected from Sanborn maps. It was possible in this way to obtain a representative sample of additional dwelling units not indicated on the Sanborn maps as well as those not obvious by field inspection.

The sampling procedure was accomplished separately for each census enumeration district in the internal study area. See Exhibit 9. Interview forms were also coded to indicate the origin-destination zone within which the dwelling unit was located.

A total of 3,040 dwelling unit samples were selected. Of these, 189 were found to be demolished, vacant or utilized for commercial purposes only. An additional 89 samples were added in the field in accordance with procedures outlined above. The residents of 72 selected dwelling units could not be interviewed due to sickness, absence from the premises after repeated calls, or refusal to cooperate in the survey. The total number of completed interviews, therefore, amounted to 2,868 dwelling units.

A sample of one-third of all trucks registered in the internal area was selected by the State from vehicle registration records. In instances where the selected truck was found to be demolished or out of service, used continuously elsewhere, or transferred out of the internal area to owners residing elsewhere, this was noted by the interviewers and the total sample was adjusted accordingly.

All taxis were included in the survey due to the relatively small number registered in the Billings Metropolitan Area.

Dwelling Unit Interviews

Occupants of dwelling units selected for interviews were notified in advance before an interviewer was assigned to their home. Information was then obtained pertaining to each trip made by each resident of

the household over five years of age for the preceding 24-hour period. Interviews were not made on Sunday or Monday since only trips made on a weekday (Monday through Friday) were included in the survey.

For each trip made by each resident of the household over five years of age, the interviewer obtained the origin and destination of the trip; mode of travel; times of departure and arrival; purpose of trip at both origin and destination; land use at both origin and destination; and, for auto driver trips only, the number of persons in the car and type of parking space utilized.

The interviewer also obtained other basic data regarding the dwelling unit and residents. These included type of structure (if different from that indicated by samplers); number of passenger cars owned; total number of residents; number of residents over five years old; the number of years during which the head of the household had resided in this dwelling unit; and, for each resident over five years of age, their sex and information regarding their occupation and industry.

Trips made by visitors residing in the household were also included provided that the visitor's permanent place of residence was found to be outside of the internal survey area.

Truck Interviews

The operators of each truck selected in the sample were contacted to acquire information regarding each trip made by the truck during the preceding 24 hours. As in the dwelling unit survey, information was obtained for weekdays only.

For each trip made by the sample truck, the interviewer obtained the location of origin and destination; mid-point time of the trip; and commodity carried. Other data regarding the type of truck; licensed capacity; and industry and business of the operator were also acquired.

Taxi Interviews

Trip records of all taxis registered in the internal survey area were reviewed to obtain information regarding taxi trips made during a 24-hour period on a weekday. The information obtained included origin and destination of each trip; mid-point time, and vehicle occupancy.

THE EXTERNAL SURVEY

Each point at which the external cordon line intersected a road or highway was designated an external survey station. There were fifteen such stations on the external cordon line. See Exhibit 2. A representative sample of all drivers entering or leaving the internal survey area at these points were interviewed. Traffic at three stations (numbers 7, 10 and 15 in Exhibit 2) was found to be too light, however, to warrant inclusion in the survey.

Interviews were conducted for a 24-hour period at external survey stations where the daily volume of traffic exceeded 5,000 vehicles (Stations 8, 12 and 14 in Exhibit 2). Interviews were made between the hours of 6:00 A. M. and 10:00 P. M. at other stations. Approximately two-thirds of all vehicles entering and leaving the survey area during the study period were interviewed.

Drivers were asked to provide information regarding their origin, destination and purpose of trip. Motorists passing through the internal area were also asked to specify the location and purpose of any stop they made or intended to make within the internal area. In addition, interviewers recorded information pertaining to vehicle occupancy, vehicle type and place of registration.

Vehicle volume and classifcation counts were also made at each external interview station during the period of the study.

TABULATION OF SURVEY DATA

Data compiled in both the internal and external surveys were coded in accordance with procedures established by the Bureau of Public Roads. This information was then compiled and summarized by statistical tabulating methods to obtain the tables and exhibits described later in this report.

Sample data acquired in both the internal and external surveys were expanded in accordance with established procedures to represent the total number of trips on an average weekday in 1961.

ACCURACY OF SURVEY DATA

Two screen lines were selected, each of which divided the internal survey area into two parts. The locations of both lines--designated screen lines "A" and "B"--are shown in Exhibit 2. Vehicle volume and classification counts were made at crossings of each screen line for later comparison with expanded data obtained in the internal and external surveys.

Screen line A, dividing the area in a southwest to northeast direction along the Northern Pacific Railway tracks was agreed on prior to start of the survey. It was also agreed that it would be advisable to establish another--or secondary--screen line for the following reasons:

(a) Predominant traffic movements in the Billings area take place north of screen line A. It was deemed desirable, therefore, to establish another line which would intercept a larger proportion of the total traffic.

(b) The Northern Pacific Railway tracks make up the south boundary of the central business district, therefore making the screen line susceptible to error resulting from motorists cruising in search of a parking space or parking on the side of the line opposite from which their destination is located.

(c) The Northern Pacific industrial site and various adjoining areas located north of the screen line generated numerous "double crossings", the number of which was difficult to establish.

Screen line B was established, therefore, to alleviate some of these difficulties. The location of screen line B running generally in a north-south direction along Fifth Street West, South 34th Street and Riverside Road is also shown in Exhibit 2.

Manual traffic classification counts were made for a 16-hour period during each of two days on every crossing of screen line A. These were adjusted to an average weekday during the survey on the basis of recording machine counts made for a total of at least 5 days.

It can be seen from Exhibit 2 that coverage of screen line B to the extent possible at screen line A would have been impractical. Numerous small residential streets cross screen line B throughout its length. It was decided, therefore, to confine manual classification counts to major street crossings. Traffic volumes crossing the line on minor streets were determined through use of automatic counters.

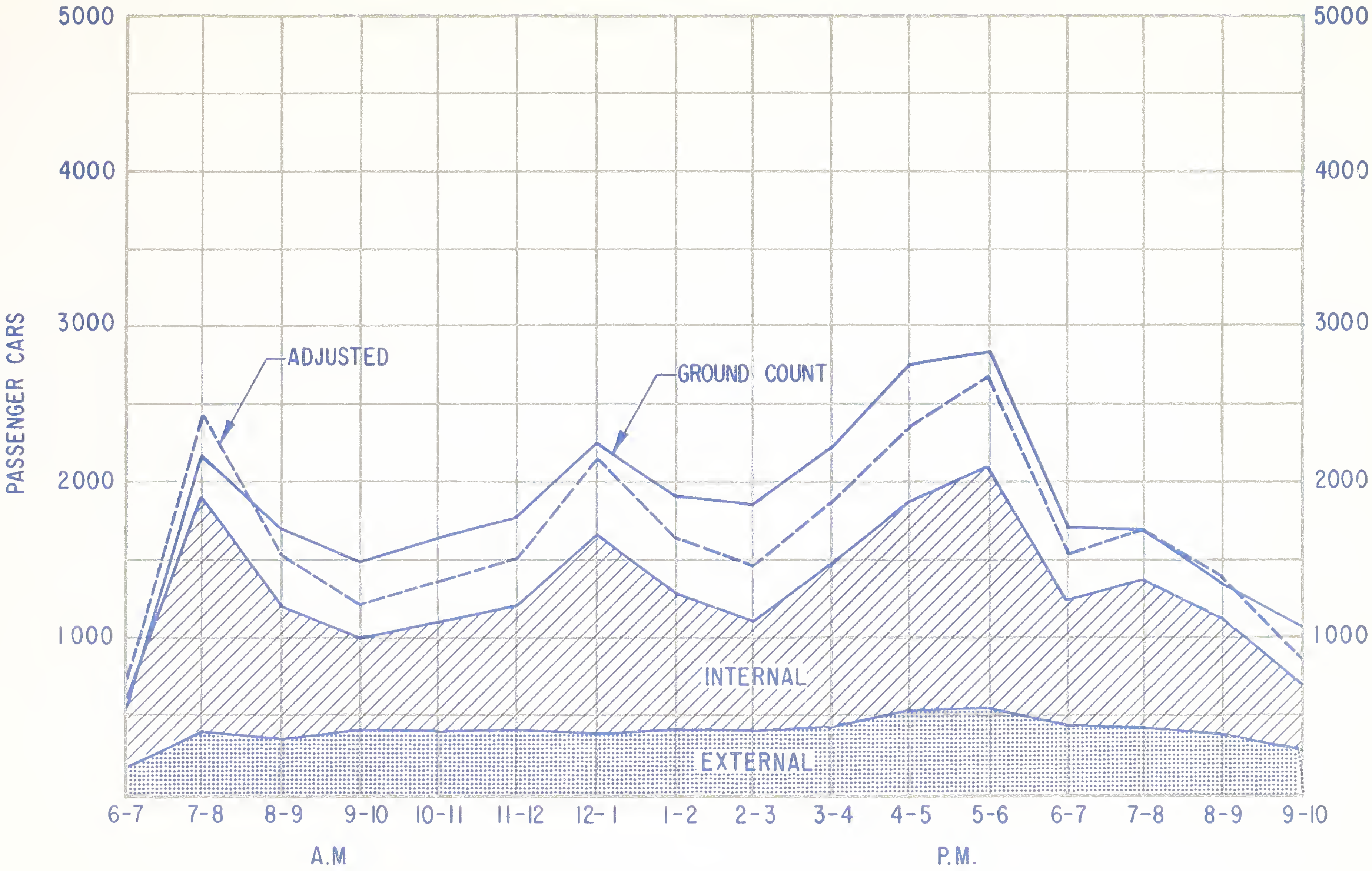
Traffic data from both the internal and external surveys were analyzed to determine the comparison between expanded volumes crossing both screen lines and actual ground counts. The procedure primarily involved compilation of vehicle trips with origins and destinations in zones on opposite sides of the screen lines. Special tabulations were made of traffic attributable to the Northern Pacific industrial site and adjoining areas, however, as well as the area near and including Billings Airport. These were necessary to determine the approximate magnitude of the obviously inherent error due to double crossings of both screen lines. Figures 1 through 4 show the comparison of observed volumes of traffic crossing both screen lines and the number of screen line crossings derived from expansion of internal and external survey data. It was not reasonably possible to segregate autos and trucks at screen line B due to the limited number of classification counts which were made. It was found that the total expanded survey data amounted to 72.4 percent of the ground count at screen line A and 74.9 percent at screen line B.

Comparisons were also made of the expanded number of trips by residents of the area crossing the external cordon line as reported in both the internal and external surveys. The cordon line comparison showed that expansion of internal survey data accounted for 69.2 percent of cordon line crossings by residents of the area reported in the external survey.

While the results were consistent, it was apparent that the data should be adjusted to more nearly reflect ground counts. Various combinations of expansion factors were considered. A detailed analysis was made of those which produced the best results.

It had been determined in previous surveys of this type that work travel is usually more fully reported in the internal survey than non-work travel. The time patterns of travel for various trip purposes also differ widely. For purposes of adjusting the internal

FIGURE I



BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

COMPARISON OF PASSENGER CAR TRIPS AT SCREEN LINE A

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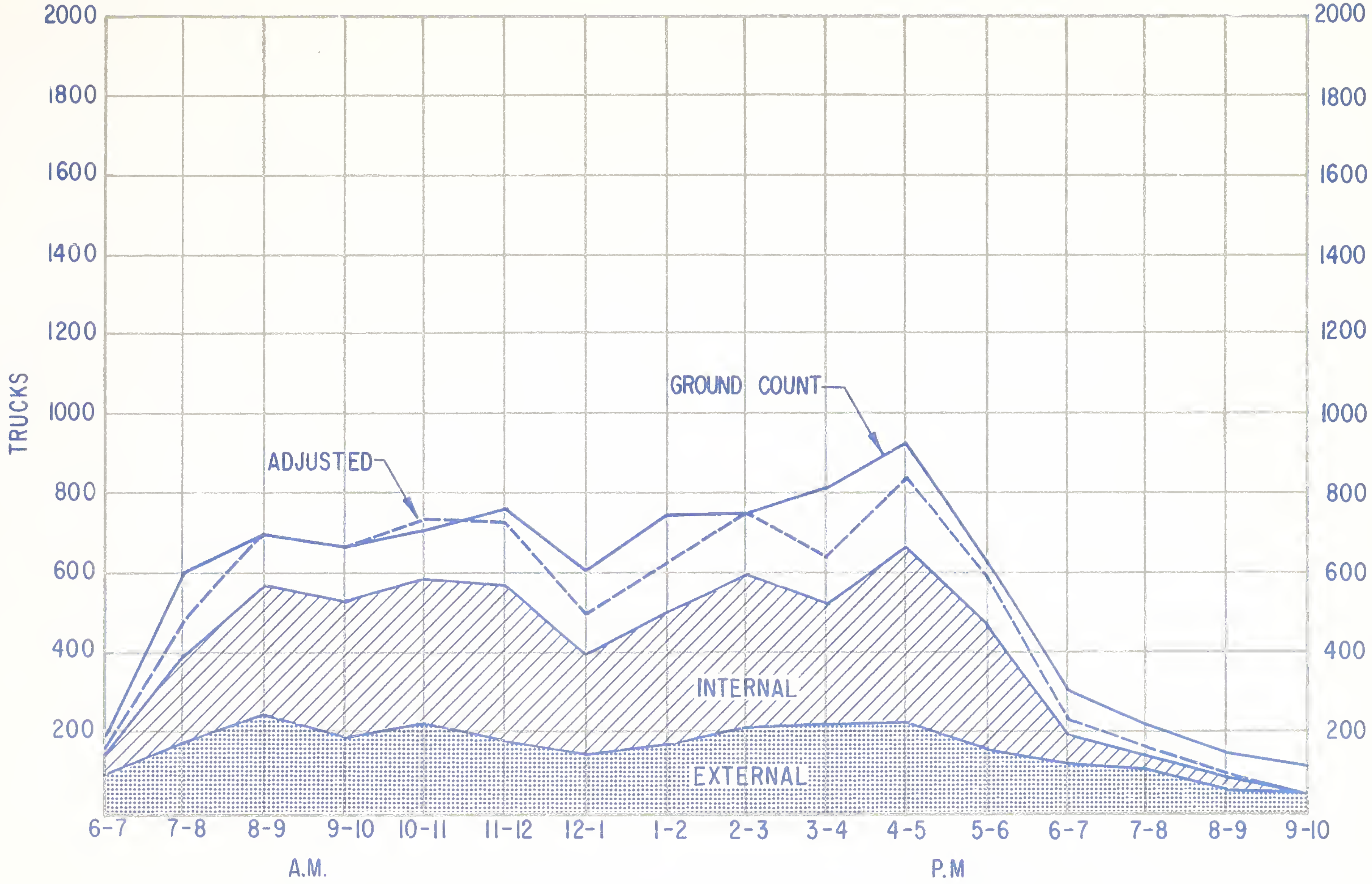
FIGURE 2



BILLING METROPOLITAN AREA
TRANSPORTATION STUDY

COMPARISON OF TRUCK TRIPS AT SCREEN LINE A

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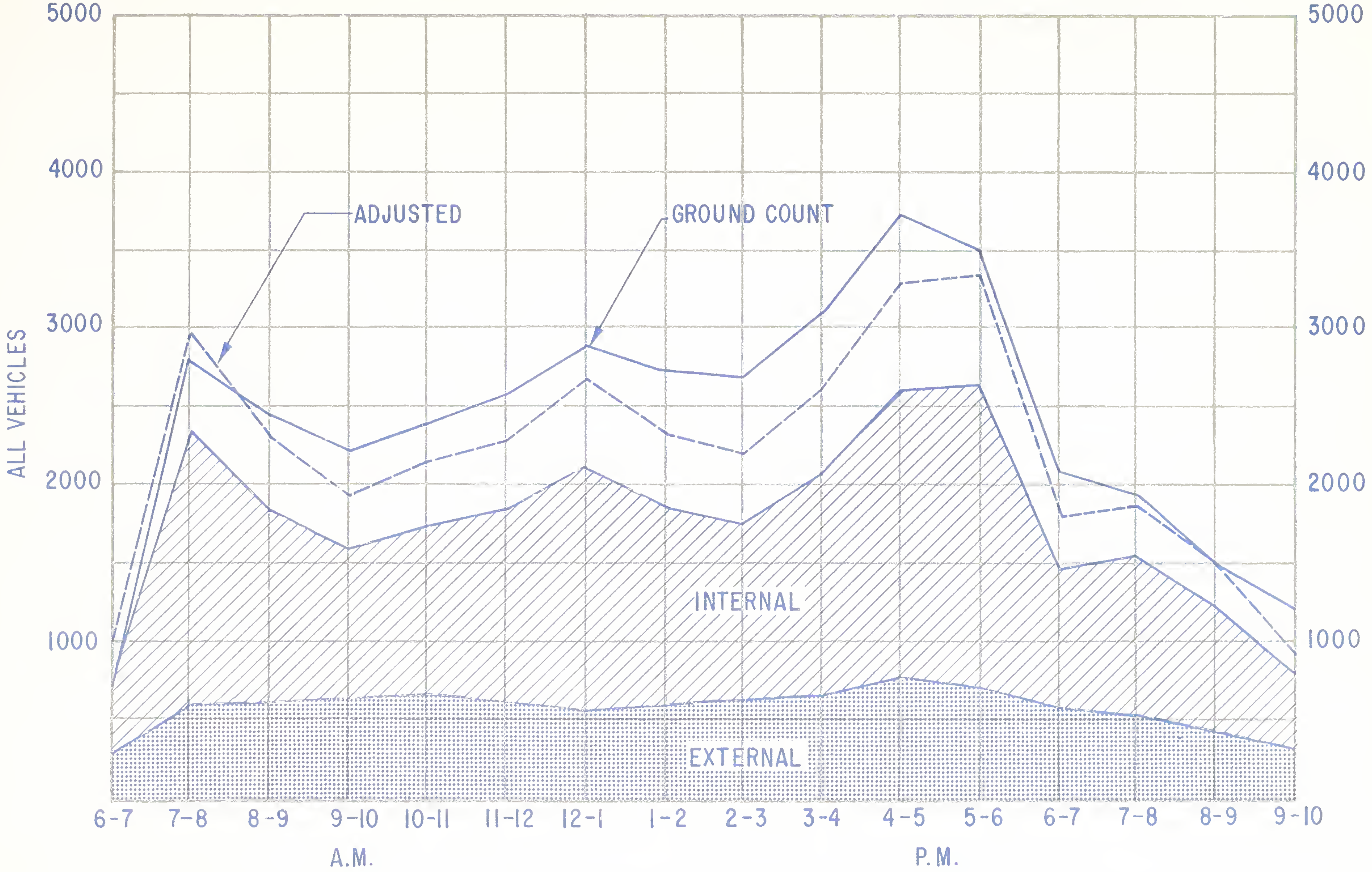

BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

COMPARISON OF TOTAL TRIPS AT
SCREEN LINE A

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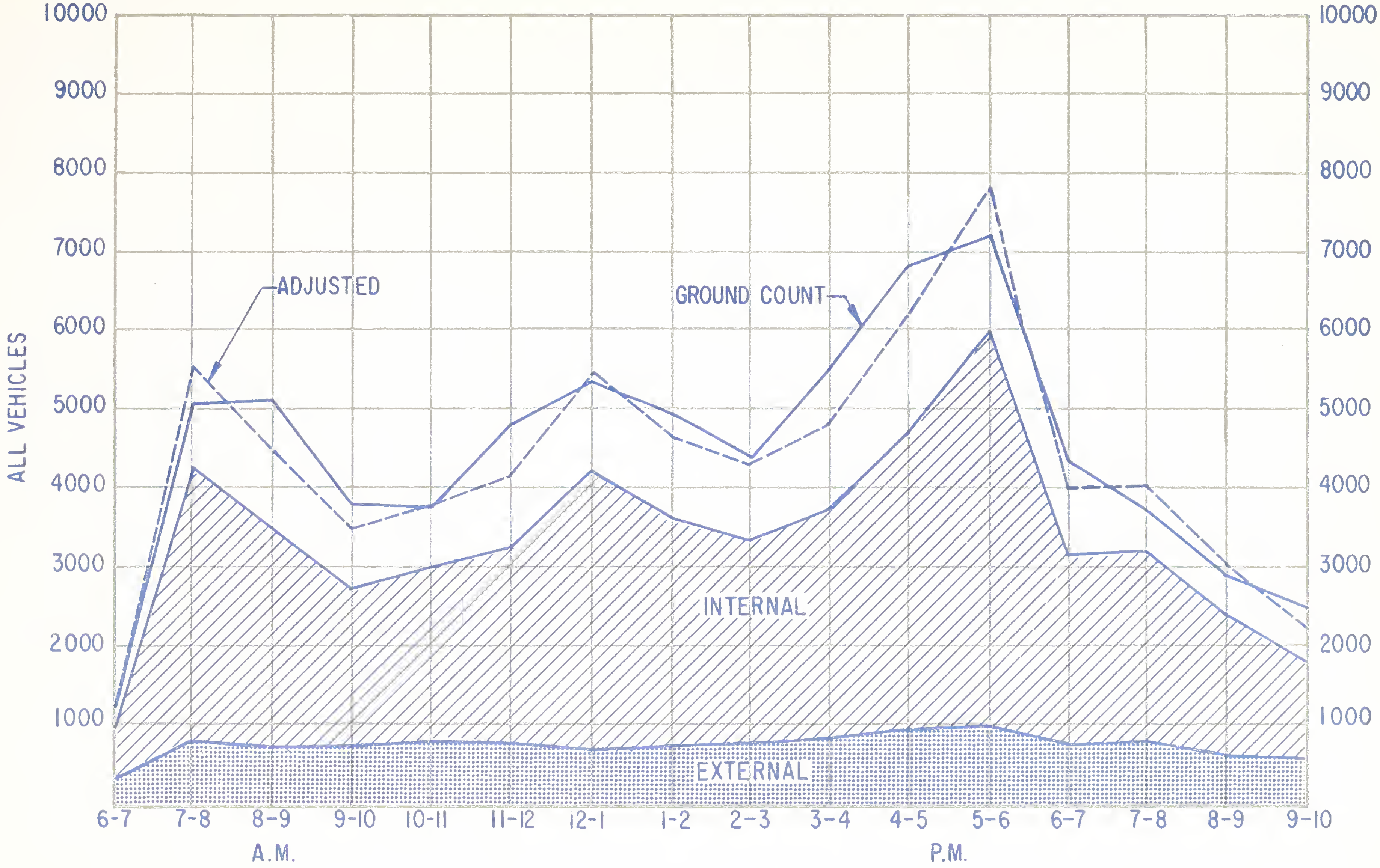
FIGURE 3

FIGURE 4



BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

COMPARISON OF TOTAL TRIPS AT SCREEN LINE B

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survey data, therefore, passenger car trips made by residents of the internal area were divided into three major categories by purpose--work, shopping and other. Various adjustment factors were applied to each and the composite results were analyzed to determine the most satisfactory combination of factors. It was found that expansion of non-work travel by a factor of 1.6, without further adjustment of work travel, produced the best results. A 1.4 adjustment factor for trucks produced satisfactory results. With the approval of the Bureau of Public Roads and the State Highway Department, these adjustments were made. The resulting adjusted travel patterns are also shown in Figures 1 through 4.

Tables A-1 through A-6 summarize the adjusted screen line comparisons in tabular form. Table A-7 summarizes the adjusted hourly distribution of trips by residents of the internal area crossing the external cordon line as reported in the internal and external surveys.

1961 TRAVEL PATTERNS

Table B-1 summarizes statistics related to dwelling units in each census enumeration district in the internal survey area. Definitions of enumeration district boundaries are shown in Exhibit 9.

Summaries of trip purposes for various modes of travel are presented in Table B-2. Table B-2a summarizes purpose of trip for local and/or through trips crossing the external cordon line at each survey station. Passenger car occupancy recorded in both the internal and external surveys is summarized in Table B-3.

Tables C-1, C-2, C-3 and C-4 are enclosed in a pocket in the back of this report. Tables C-3 and C-4 show the number of vehicle passenger trips from one internal zone to another. These tables deal only with trips having both an origin and destination within the internal survey area. Table C-3 pertains to auto, truck and taxi passengers while data related to transit passengers is presented in Table C-4.

Table C-2 shows the number of passenger car and taxicab trips between internal zones as well as the number of passenger car and taxicab trips between internal zones and external stations.

It should be noted that, while external origins and destinations were coded in accordance with sectors, districts and zones defined in Exhibits 3, 4 and 5, Table C-2 shows only the survey station at which each trip crossed the external cordon line. This method of presenting the data is in accordance with procedures established by the Bureau of Public Roads.

Table C-1 is a summary of Tables C-2, C-3 and C-4 except that external trips shown in Table C-2 are not included. External trip information collected in the survey dealt with movements of vehicles only, not people. It is not comparable, therefore, with the remainder of the data summarized in Table C-1.

Table D-1 (also folded in the pocket at the back of this report) shows the movement of trucks between internal zones as well as between external stations and internal zones. The number of through trips between the external stations is also shown.

The remaining table folded in the back pocket, Table E-1, summarizes Tables C-2 and D-1. Table E-1 shows the total number of vehicular trips between internal zones as well as those between external stations and internal zones and through trips.

The "C", "D", and "E" tables presented in this report are based on total 24-hour travel on a weekday. They are also "rectangular" in nature insofar as travel is shown from one zone or station to another rather than between various zones or stations.

Desire lines of travel determined from expanded 1961 survey data are shown in Exhibits 6, 7 and 8. Exhibit 6 shows the indicated desire lines of travel to and from the Billings central business district. Desire lines of travel between various districts (groups of zones) within the internal survey area are shown in Exhibit 7. Exhibit 8 shows the desire lines of travel between external survey stations and internal districts. The pattern of through trips crossing the internal area is also shown in a lighter shade in Exhibit 8.

Exhibits 10 through 15 were prepared to show 1961 average daily traffic flows to and from external stations.

Tabulations of type of parking related to purpose of trip, as determined from the internal survey, are shown in Tables F-1 and F-2. Table F-1 shows the type of parking for each trip purpose for all passenger car trips in the internal area. Table F-2 shows the type of parking for each trip purpose only for trips having destinations in the central business district.

TABLES

Table A-1

COMPARISON OF 1961 PASSENGER CAR TRIPS AT SCREEN LINE "A"

Location: Northern Pacific Railway Tracks

Hour Period	Expanded Trip Data			Ground Count	Percent (Total/ Ground Count)
	Internal	External	Total		
A.M.					
6:00- 6:59	475.9	162.1	638.0	518.0	123.2
7:00- 7:59	1,773.5	394.2	2,167.7	2,157.0	100.5
8:00- 8:59	1,075.6	347.1	1,422.7	1,690.0	84.2
9:00- 9:59	807.9	406.6	1,214.5	1,497.0	81.1
10:00-10:59	974.9	409.4	1,384.3	1,641.0	84.4
11:00-11:59	1,137.6	409.6	1,547.2	1,770.0	87.4
P.M					
12:00-12:59	1,719.6	387.3	2,106.9	2,245.0	93.8
1:00- 1:59	1,211.1	405.7	1,616.8	1,922.0	84.1
2:00- 2:59	976.0	389.0	1,365.0	1,884.0	72.5
3:00- 3:59	1,451.9	420.8	1,872.7	2,206.0	84.9
4:00- 4:59	1,808.3	517.2	2,325.5	2,743.0	84.8
5:00- 5:59	1,986.0	526.6	2,512.6	2,836.0	88.6
6:00- 6:59	1,116.7	427.4	1,544.1	1,711.0	90.2
7:00- 7:59	1,395.5	414.4	1,809.9	1,700.0	106.5
8:00- 8:59	1,102.4	358.9	1,461.3	1,331.0	109.8
9:00- 9:59	635.9	249.7	885.6	1,072.0	82.6
Totals	19,648.8	6,226.0	25,874.8	28,923.0	89.5

Table A-2

COMPARISON OF 1961 TRUCK TRIPS AT SCREEN LINE "A"

Location: Northern Pacific Railway Tracks

Hour Periods	Expanded Trip Data Internal	Expanded Trip Data External	Expanded Trip Data Total	Ground Count	Percent (Total/ Ground Count)
A.M.					
6:00- 6:59	78.4	87.8	166.2	190.0	87.5
7:00- 7:59	299.6	171.4	471.0	592.0	79.6
8:00- 8:59	459.2	232.1	691.3	689.0	100.3
9:00- 9:59	478.8	179.8	658.6	660.0	99.8
10:00-10:59	515.2	210.2	725.4	703.0	103.2
11:00-11:59	540.4	174.9	715.3	748.0	95.6
P.M.					
12:00-12:59	350.0	139.9	489.9	599.0	81.8
1:00- 1:59	462.0	164.9	626.9	740.0	84.7
2:00- 2:59	546.0	203.1	749.1	745.0	100.6
3:00- 3:59	425.6	211.5	637.1	808.0	78.8
4:00- 4:59	604.8	227.2	832.0	926.0	89.8
5:00- 5:59	428.4	153.1	581.5	616.0	94.4
6:00- 6:59	98.0	123.1	221.1	300.0	73.7
7:00- 7:59	50.4	104.8	155.2	207.0	75.0
8:00- 8:59	33.6	53.8	87.4	141.0	62.0
9:00- 9:59	-	44.2	44.2	111.0	39.8
Totals	5,370.4	2,481.8	7,852.2	8,775.0	89.5

Table A-3

COMPARISON OF 1961 TAXI TRIPS AT SCREEN LINE "A"

Location: Northern Pacific Railway Tracks

Hour Periods	Expanded Trip Data Internal	External*	Total	Ground Count	Percent (Total/ Ground Count)
A.M.					
6:00- 6:59	3.0		3.0	11.0	27.3
7:00- 7:59	16.6		16.6	12.0	138.3
8:00- 8:59	28.0		28.0	29.0	96.5
9:00- 9:59	26.0		26.0	20.0	130.0
10:00-10:59	21.0		21.0	26.0	80.8
11:00-11:59	23.0		23.0	18.0	127.8
P.M.					
12:00-12:59	17.0		17.0	20.0	85.0
1:00- 1:59	30.0		30.0	24.0	125.0
2:00- 2:59	26.0		26.0	22.0	118.2
3:00- 3:59	22.0		22.0	26.0	84.6
4:00- 4:59	26.6		26.6	27.0	98.5
5:00- 5:59	32.0		32.0	32.0	100.0
6:00- 6:59	18.0		18.0	21.0	85.7
7:00- 7:59	16.0		16.0	25.0	64.0
8:00- 8:59	21.0		21.0	24.0	87.5
9:00- 9:59	18.0		18.0	22.0	81.8
Totals	344.2		344.2	359.0	95.9

*-Taxi trips crossing screen line "A" from external survey were nominal and not included in this comparison.

Table A-4

COMPARISON OF 1961 TOTAL TRIPS AT SCREEN LINE "A"

Location: Northern Pacific Railway Tracks

Hour Periods	Expanded Trip Data			Ground Count	Percent (Total/ Ground Count)
	Internal	External	Total		
A.M.					
6:00- 6:59	557.3	249.9	807.2	719.0	112.3
7:00- 7:59	2,089.7	565.6	2,655.3	2,761.0	96.2
8:00- 8:59	1,562.8	579.2	2,142.0	2,408.0	88.9
9:00- 9:59	1,312.7	586.4	1,899.1	2,177.0	87.2
10:00-10:59	1,511.1	619.6	2,130.7	2,370.0	89.9
11:00-11:59	1,701.0	584.5	2,285.5	2,536.0	90.1
P.M.					
12:00-12:59	2,086.6	527.2	2,613.8	2,864.0	91.3
1:00- 1:59	1,703.1	570.6	2,273.7	2,686.0	84.6
2:00- 2:59	1,548.0	592.1	2,140.1	2,651.0	80.7
3:00- 3:59	1,899.5	632.3	2,531.8	3,040.0	83.3
4:00- 4:59	2,439.7	744.4	3,184.1	3,696.0	86.1
5:00- 5:59	2,446.4	679.7	3,126.1	3,484.0	89.7
6:00- 6:59	1,232.7	550.5	1,783.2	2,032.0	87.8
7:00- 7:59	1,461.9	519.2	1,981.1	1,932.0	102.5
8:00- 8:59	1,157.0	412.7	1,569.7	1,496.0	104.9
9:00- 9:59	653.9	293.9	947.8	1,205.0	78.7
Totals	25,363.4	8,707.8	34,071.2	38,057.0	89.5

Table A-4a

COMPARISON OF 1961 TOTAL TRIPS AT SCREEN LINE "B"

Location: East of 5th Street West

Hour Periods	Expanded Trip Data Internal	 External	 Total	Ground Count	Percent (Total/ Ground Count)
A.M.					
6:00- 6:59	734.2	271.1	1,005.3	1,100.0	91.4
7:00- 7:59	4,117.3	749.3	4,866.6	5,011.0	97.1
8:00- 8:59	3,485.6	683.3	4,168.9	5,076.0	82.1
9:00- 9:59	2,744.8	710.1	3,454.9	3,757.0	92.0
10:00-10:59	3,047.5	775.5	3,823.0	3,719.0	102.8
11:00-11:59	3,626.2	742.4	4,368.6	4,759.0	91.8
P.M.					
12:00-12:59	4,865.3	652.3	5,517.6	5,338.0	103.4
1:00- 1:59	3,936.1	727.8	4,663.9	4,925.0	94.7
2:00- 2:59	3,609.6	752.9	4,362.5	4,358.0	100.1
3:00- 3:59	4,133.0	818.6	4,951.6	5,513.0	89.8
4:00- 4:59	5,257.9	905.1	6,163.0	6,815.0	90.4
5:00- 5:59	6,545.5	958.2	7,503.7	7,174.0	104.6
6:00- 6:59	3,360.5	734.9	4,095.4	4,303.0	95.2
7:00- 7:59	3,591.1	771.1	4,362.2	3,709.0	117.6
8:00- 8:59	2,664.7	592.7	3,257.4	2,829.0	115.1
9:00- 9:59	1,830.9	519.5	2,350.4	2,474.0	95.0
Totals	57,550.2	11,364.8	68,915.0	70,860.0	97.3

Table A-5

1961 PASSENGER CAR TRIPS CROSSING EXTERNAL CORDON LINE, MADE BY RESIDENTS OF THE STUDY AREA

Hour Periods	Expanded Internal	Expanded External	Percent (Internal/External)
A.M.			
6:00- 6:59	217.0	168.8	128.6
7:00- 7:59	611.9	536.6	114.0
8:00- 8:59	351.8	453.5	77.6
9:00- 9:59	477.6	466.3	102.4
10:00-10:59	402.3	506.7	79.4
11:00-11:59	488.5	523.0	93.4
P.M.			
12:00-12:59	436.3	584.1	74.7
1:00- 1:59	474.5	550.0	86.3
2:00- 2:59	547.5	530.9	103.1
3:00- 3:59	566.8	528.9	107.2
4:00- 4:59	964.4	739.8	130.4
5:00- 5:59	676.0	716.3	94.4
6:00- 6:59	476.2	584.3	81.5
7:00- 7:59	688.9	773.7	89.0
8:00- 8:59	393.2	564.1	69.7
9:00- 9:59	288.6	530.3	54.4
Totals	8,061.5	8,757.3	92.1

Table A-6

1961 TRUCK TRIPS CROSSING EXTERNAL CORDON LINE MADE BY RESIDENTS OF THE STUDY AREA

Hour Periods	Expanded Internal	Expanded External	Percent (Internal/External)
A.M.			
6:00- 6:59	61.6	94.7	65.0
7:00- 7:59	257.6	225.2	114.4
8:00- 8:59	336.0	305.6	110.0
9:00- 9:59	280.0	272.2	102.9
10:00-10:59	240.8	263.9	91.2
11:00-11:59	212.8	253.9	83.8
P.M.			
12:00-12:59	162.4	173.8	93.4
1:00- 1:59	235.2	271.0	86.8
2:00- 2:59	263.2	299.8	87.8
3:00- 3:59	313.6	303.8	103.2
4:00- 4:59	308.0	335.3	91.9
5:00- 5:59	173.6	177.1	98.0
6:00- 6:59	112.0	121.7	92.0
7:00- 7:59	50.4	127.7	39.5
8:00- 8:59	-	58.6	-
9:00- 9:59	28.0	54.3	51.6
Totals	3,035.2	3,338.6	90.9

Table A-7

1961 TOTAL TRIPS CROSSING EXTERNAL CORDON LINE, MADE BY RESIDENTS OF THE STUDY AREA

Hour Periods	Expanded Internal	Expanded External	Percent (Internal/External)
A.M.			
6:00- 6:59	278.6	263.5	105.7
7:00- 7:59	869.5	761.8	114.1
8:00- 8:59	687.8	759.1	90.6
9:00- 9:59	757.6	738.5	102.6
10:00-10:59	643.1	770.6	83.4
11:00-11:59	701.3	776.9	90.3
P.M.			
12:00-12:59	598.7	757.9	79.0
1:00- 1:59	709.7	821.0	86.4
2:00- 2:59	810.7	830.7	97.6
3:00- 3:59	880.4	832.7	105.7
4:00- 4:59	1,272.4	1,075.1	118.4
5:00- 5:59	849.6	893.4	95.1
6:00- 6:59	588.2	706.0	83.3
7:00- 7:59	739.3	901.4	82.0
8:00- 8:59	393.2	622.7	63.1
9:00- 9:59	316.6	584.6	54.2
Totals	11,096.7	12,095.9	91.7

Table B-1

1961 DWELLING INTERVIEW STATISTICS

Billings Internal Study Area

Enumeration District	Dwelling Units Survey	Dwelling Units Census*	Passenger Cars Owned	Total Persons Survey	Total Persons Census*	Persons Over 5 Yrs. of Age Survey	Persons Over 5 Yrs. of Age Census*	Persons Over 5 Yrs. Making Trips	Total Number of Trips
1	214	233	256	616	644	561	574	317	1,244
2	228	338	204	600	890	498	777	276	1,344
2P	390	332	488	1,110	1,016	988	906	708	2,946
3	268	310	262	665	773	555	696	397	1,702
4	355	531	192	525	757	525	737	241	774
5	258	358	168	498	687	498	639	288	978
6	294	371	332	774	959	730	880	499	2,477
7	217	177	291	731	928	694	884	490	2,573
8	342	390	492	1,176	1,238	1,056	1,119	816	3,798
9	648	645	1,116	2,310	2,304	2,070	2,050	1,524	7,884
10N	238	227	451	952	883	811	787	677	3,325
10P	683	637	1,012	2,751	2,609	2,312	2,167	1,519	6,832
11	805	749	1,458	3,111	2,927	2,635	2,502	1,964	8,802
12	321	347	491	945	1,100	869	1,019	624	3,018
13	254	275	313	667	777	625	722	383	1,758
14	180	261	174	402	553	384	532	234	1,038
15	390	433	304	787	830	732	792	372	1,668
16	226	311	146	458	620	384	590	165	641
17	313	334	371	998	893	896	814	570	2,618
18	336	341	486	1,002	1,063	930	943	726	3,930
19	636	629	858	2,172	2,205	1,920	1,911	1,224	5,904
20N	628	599	976	2,593	2,570	2,104	2,107	1,495	6,088
20P	43	26	73	214	107	152	79	110	555
21	492	464	708	1,932	1,954	1,620	1,677	1,098	4,752
22	616	591	927	2,507	2,502	2,202	2,123	1,397	6,270
23N	148	114	224	720	494	614	406	277	1,062
23P	498	476	702	2,172	2,028	1,782	1,609	1,272	5,094
24	677	750	1,019	2,373	2,643	2,104	2,302	1,458	7,924

Table B-1 (Continued)

1961 DWELLING INTERVIEW STATISTICS

Billings Internal Study Area

Enumeration District	Dwelling Units		Passenger Cars Owned	Total Persons		Persons Over 5 Yrs. of Age		Persons Over 5 Yrs. Making Trips	Total Number of Trips
	Survey	Census*		Survey	Census*	Survey	Census*		
25	291	327	341	794	1,104	701	945	490	2,275
26	264	297	384	762	918	708	812	540	2,328
27	323	326	378	921	1,016	823	892	567	2,318
28	250	282	348	775	844	659	759	445	2,251
29	287	339	409	933	978	885	890	677	3,410
30	323	372	366	958	1,008	823	914	519	2,208
31	322	359	347	781	871	744	800	539	2,338
32	342	376	360	860	974	787	882	494	1,793
33	315	350	347	1,002	1,001	838	880	573	2,085
34	293	341	354	1,049	1,249	909	1,073	519	1,891
35	244	300	262	720	967	646	859	427	1,409
36	246	283	192	780	872	696	752	336	1,416
37	248	255	235	869	836	697	713	338	773
38	289	332	207	791	732	667	663	289	1,121
39	233	356	208	706	804	624	726	321	951
40	207	281	104	592	757	531	653	110	195
41	264	285	330	1,194	966	990	824	444	1,566
Sub-Total Billings - City	15,439	16,710	19,666	50,248	52,851	43,979	46,381	28,749	127,327

Table B-1 (Concluded)

1961 DWELLING INTERVIEW STATISTICS

Billings Internal Study Area

Enumeration District	Dwelling Units Survey	Dwelling Units Census*	Passenger Cars Owned	Total Persons Survey	Total Persons Census*	Persons Over 5 Yrs. of Age Survey	Persons Over 5 Yrs. of Age Census*	Persons Over 5 Yrs. Making Trips	Total Number of Trips
42S**	3	8	6	9	29	9	25	3	6
42N	7	11	14	35	49	28	47	28	91
42P**	128	143	195	421	554	366	480	232	933
42R	15	37	20	50	257	45	231	45	225
43	353	359	391	1,191	1,176	1,021	996	561	2,262
44	43	67	37	92	178	85	156	43	110
49N	38	44	61	190	164	167	147	91	213
49P	9	4	14	41	13	36	10	27	72
50	290	307	447	1,153	1,104	1,021	937	529	1,890
51	616	623	970	2,788	2,544	2,111	2,066	1,537	5,972
52	295	404	425	1,080	1,428	873	1,198	496	2,024
53	195	163	286	774	665	702	562	488	2,242
54N	35	30	58	151	144	128	111	104	383
54P	99	56	132	462	238	304	170	251	957
Billings West	3	-	12	33	20	30	-	30	81
Sub-Total Outside Billings	2,129	2,256	3,068	8,470	8,563	6,926	7,136	4,465	17,461
Total Study Area	17,568	18,966	22,734	58,718	61,414	50,905	53,517	33,214	144,788

*-1960 Census of Population, U. S. Department of Commerce.

**-Part of Enumeration District outside of survey area.

Note: Total number of trips shown on this table were not adjusted on the basis of screen line comparisons.

Table B-2

1961 AUTO DRIVER TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose										
		0	1	2	3	4	5	6	7	8	9	Total
Home	0		9,264	4,927	694	983	7,357	49	784	9,828	10,616	44,502
Work	1	8,739	4,676	753	69	49	480	20	4,837	851	1,579	22,053
Business	2	4,135	507	1,252	51	29	439		196	1,171	400	8,180
Medical-Dental	3	567	18	39	68		50		40	225	89	1,096
School	4	827	79	19		10	155		167	49	117	1,423
Social-Recreation	5	8,041	171	303	39	48	1,531		127	974	1,048	12,282
Change Travel Mode	6	29	6									35
Eat Meal	7	855	2,825	146	39	127	205		20	188	470	4,875
Shopping	8	11,348	202	597	29	10	1,114		295	2,958	747	17,300
Serve Passenger	9	9,357	1,263	490	89	224	996	10	364	1,271	2,601	16,665
Total		43,898	19,011	8,526	1,078	1,480	12,327	79	6,830	17,515	17,667	128,411

1961 AUTO PASSENGER TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose										
		0	1	2	3	4	5	6	7	8	9	Total
Home	0		2,427	1,147	669	2,782	10,939	147	654	4,165	380	23,310
Work	1	2,516	209	68			224	20	611	137	39	3,824
Business	2	880	55	264			196		19	187	10	1,611
Medical-Dental	3	468		19	59	30	107			108	10	801
School	4	1,859	18	10	89	10	429	19	186	119	20	2,759
Social-Recreation	5	11,097	73	107	19	225	5,442	10	303	1,019	48	18,343
Change Travel Mode	6	108	13			19	10			10		160
Eat Meal	7	871	368	10		166	237		10	79	10	1,751
Shopping	8	4,722	19	107	20		992		167	1,322	30	7,379
Serve Passenger	9	350	37	10		50	87			77	77	688
Total		22,871	3,219	1,742	856	3,282	18,663	196	1,950	7,223	624	60,626

Table B-2 (Continued)

1961 BUS PASSENGER TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose										
		0	1	2	3	4	5	6	7	8	9	Total
Home	0		426	73	48	266	67			85		965
Work	1	401	6	6					6			419
Business	2	73								6		79
Medical-Dental	3	30								6		36
School	4	232	12				24					268
Social-Recreation	5	48				24				6		78
Change Travel Mode	6	6										6
Eat Meal	7	6										6
Shopping	8	128		6						6		140
Serve Passenger	9											
Total		924	444	85	48	290	91		6	109		1,997

1961 TAXI PASSENGER TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose										
		0	1	2	3	4	5	6	7	8	9	Total
Home	0		103	6	12		12			37		170
Work	1	85					6		6			97
Business	2	25										25
Medical-Dental	3					6						6
School	4											
Social-Recreation	5	6										6
Change Travel Mode	6	12										12
Eat Meal	7		6									6
Shopping	8	37										37
Serve Passenger	9											
Total		165	109	6	12	6	18		6	37		359

Table B-2 (Continued)

1961 TRUCK PASSENGER TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose										
		0	1	2	3	4	5	6	7	8	9	Total
Home	0		6			6						12
Work	1	6										6
Business	2											
Medical-Dental	3											
School	4	6							6			12
Social-Recreation	5											
Change Travel Mode	6											
Eat Meal	7					6						6
Shopping	8					6						6
Serve Passenger	9											
Total		12	6			18			6			42

1961 SCHOOL BUS PASSENGER TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose										
		0	1	2	3	4	5	6	7	8	9	Total
Home	0					837						837
Work	1											
Business	2											
Medical-Dental	3											
School	4	788					6					794
Social-Recreation	5	6										6
Change Travel Mode	6					12						12
Eat Meal	7											
Shopping	8											
Serve Passenger	9											
Total		794				849	6					1,649

Table B-2 (Concluded)

1961 TOTAL TRIPS
BY RESIDENTS OF INTERNAL AREA

Purpose From		To Purpose 0	1	2	3	4	5	6	7	8	9	Total
Home	0		12,226	6,153	1,423	4,874	18,375	196	1,438	14,115	10,996	69,796
Work	1	11,747	4,891	827	69	49	710	40	5,460	988	1,618	26,399
Business	2	5,113	562	1,516	51	29	635		215	1,364	410	9,895
Medical-Dental	3	1,065	18	58	127	36	157		40	339	99	1,939
School	4	3,712	109	29	89	20	614	19	359	168	137	5,256
Social-Recreation	5	19,198	244	410	58	297	6,973	10	430	1,999	1,096	30,715
Change Travel Mode	6	155	19			31	10			10		225
Eat Meal	7	1,732	3,199	156	39	299	442		30	267	480	6,644
Shopping	8	16,235	221	710	49	16	2,106		462	4,286	777	24,862
Serve Passenger	9	9,707	1,300	500	89	274	1,083	10	364	1,348	2,678	17,353
Total		68,664	22,789	10,359	1,994	5,925	31,105	275	8,798	24,884	18,291	193,084 *

*-This total is o.4 percent lower than total shown in "C" tables due to rounding off to whole numbers.

Table B-2a

TRIP PURPOSE BY EXTERNAL STATION
PASSENGER CARS - 1961 LOCAL TRIPS

	Trip Purpose									
External Station	Work	Business	Medical or Dental	School	Social and Recreation	Change Travel Mode	Eat Meal	Shopping	Serve Passenger	Total
X01	64	207	22	1	201	1	5	52	7	560
X02	126	103	14	6	504	1	7	27	16	804
X03	143	201	31	3	291	-	18	144	6	837
X04	52	40	3	-	46	-	7	14	2	164
X05	186	210	9	2	201	5	-	60	3	676
X06	176	119	28	-	116	1	5	34	12	491
X08	741	803	121	7	996	11	8	184	76	2,947
X09	135	153	10	-	104	1	14	41	24	482
X11	101	75	8	-	125	-	-	52	13	374
X12	1,532	722	119	11	1,083	8	159	272	146	4,052
X13	248	126	24	-	219	-	22	58	37	734
X14	1,957	1,558	213	14	2,394	5	272	674	288	7,375
Total Traffic	5,461	4,317	602	44	6,280	33	517	1,612	630	19,496

Table B-2a (Continued)

TRIP PURPOSE BY EXTERNAL STATION
PASSENGER CARS - 1961 THROUGH TRIPS

	Trip Purpose									
External Station	Work	Business	Medical or Dental	School	Social and Recreation	Change Travel Mode	Eat Meal	Shopping	Serve Passenger	Total
X01	11	28	-	-	97	-	-	-	2	138
X02	15	13	-	-	16	-	-	1	1	46
X03	5	12	-	-	16	-	-	-	-	33
X04	7	-	-	-	6	-	-	-	-	13
X05	8	16	-	-	15	-	-	-	-	39
X06	11	7	-	-	16	-	-	-	-	34
X08	109	251	6	9	1,015	2	2	-	12	1,406
X09	7	13	-	1	31	1	1	1	3	58
X11	12	14	2	-	14	-	-	-	-	42
X12	235	181	8	4	657	-	13	17	35	1,150
X13	24	4	5	-	34	-	3	3	9	82
X14	240	270	2	7	1,158	6	23	55	24	1,785
Total Traffic	684	809	23	21	3,075	9	42	77	86	4,826
Total Trips	342	405	12	11	1,538	5	21	39	43	2,416

Table B-2a (Concluded)

TRIP PURPOSE BY EXTERNAL STATION
PASSENGER CARS - 1961 TOTAL LOCAL AND THROUGH TRIPS

External Station	Trip Purpose Work	Business	Medical or Dental	School	Social and Recreation	Change Travel Mode	Eat Meal	Shopping	Serve Passenger	Total
X01	75	235	22	1	298	1	5	52	9	698
X02	141	116	14	6	520	1	7	28	17	850
X03	148	213	31	3	307	-	18	144	6	870
X04	59	40	3	-	52	-	7	14	2	177
X05	194	226	9	2	216	5	-	60	3	715
X06	187	126	28	-	132	1	5	34	12	525
X08	850	1,054	127	16	2,011	13	10	184	88	4,353
X09	142	166	10	1	135	2	15	42	27	540
X11	113	89	10	-	139	-	-	52	13	416
X12	1,767	903	127	15	1,740	8	172	289	181	5,202
X13	272	130	29	-	253	-	25	61	46	816
X14	2,197	1,828	215	21	3,552	11	295	729	312	9,160
Total Traffic	6,145	5,126	625	65	9,355	42	559	1,689	716	24,322
Total Trips	5,803	4,722	614	55	7,818	38	538	1,651	673	21,912

Note: Totals on Tables B-2a do not correspond with those in Table C-2 due to subsequent adjustment of through trips with significant intermediate stops.

Table B-3

PASSENGER CAR OCCUPANCY

1961 Internal Survey

		To Purpose										
Purpose From		0	1	2	3	4	5	6	7	8	9	Total
Home	0	3.7	1.1	1.5	1.6	1.2	1.8	1.4	2.0	1.8	2.1	1.7
Work	1	1.5	1.4	1.0	1.0	1.0	1.5	2.0	2.1	2.3	2.2	1.7
Business	2	1.4	1.2	1.5	1.4	1.7	1.8	-	1.5	1.7	2.4	1.5
Medical-Dental	3	1.6	1.0	1.3	1.6	-	2.0	-	2.0	1.6	1.8	1.6
School	4	1.2	1.0	2.0	-	1.0	2.2	-	1.9	2.0	2.4	1.5
Social-Recreation	5	1.8	1.3	1.9	1.8	1.8	2.2	-	1.8	2.2	2.3	1.9
Change Travel Mode	6	1.0	1.0	-	-	-	-	-	-	-	-	1.0
Eat Meal	7	2.2	1.1	1.4	1.3	1.8	2.0	-	2.5	1.6	2.1	1.5
Shopping	8	1.8	1.2	1.8	2.3	2.0	2.2	-	2.2	2.2	2.2	1.9
Serve Passenger	9	1.9	1.3	2.2	1.6	2.7	2.3	3.0	2.0	2.3	2.8	2.1
Total		1.7	1.2	1.5	1.6	1.5	1.9	1.8	2.0	1.9	2.3	1.8

Table B-3a

PASSENGER CAR OCCUPANCY

1961 External Survey

Trip Purpose	Non-Through	Through	Total Average Occupancy
Work	1.4	1.2	1.4
Business	1.8	2.1	1.9
Medical-Dental	2.4	3.6	2.4
School	2.4	2.3	2.4
Social-Recreation	2.6	3.2	2.7
Change Travel Mode	2.9	3.7	3.0
Eat Meal	2.1	2.3	2.1
Shopping	2.7	2.4	2.7
Serve Passenger	2.3	2.8	2.3
Total	2.1	2.8	2.1

Table F-1

KIND OF PARKING RELATED TO PURPOSE OF TRIP FOR ALL AUTO DRIVER TRIPS RECORDED IN THE INTERNAL SURVEY

Kind of Parking	Trip Purpose										
	Work	Personal Business	Medical-Dental	School	Social-Recreation	Change Mode of Travel	Eat Meal	Shopping	Serve Passenger	Home	Total
Street Free	4,666	2,660	361	186	5,136	30	1,157	1,995	4,181	5,751	26,123
Street Meter	951	1,664	168	10	313		352	1,797	421	101	5,777
Lot Free	11,018	2,435	440	1,246	3,280	29	1,174	12,273	1,716	769	34,380
Lot Paid	1,211	205	60	19	121		88	472	78	42	2,296
Garage Free	92	19			39		21	29	10	1,127	1,337
Garage Paid	42	10	9		39		29	127		30	286
Service or Repairs	6	225			9			388	20	36	684
Residential Property	612	749	20	10	2,781	20	3,968	258	1,369	35,547	45,334
Cruised	198	29			190		10	20	39	44	530
Not Parked	237	518	20	9	419		30	155	9,834	488	11,710
Total	19,033	8,514	1,078	1,480	12,327	79	6,829	17,514	17,668	43,935	128,457

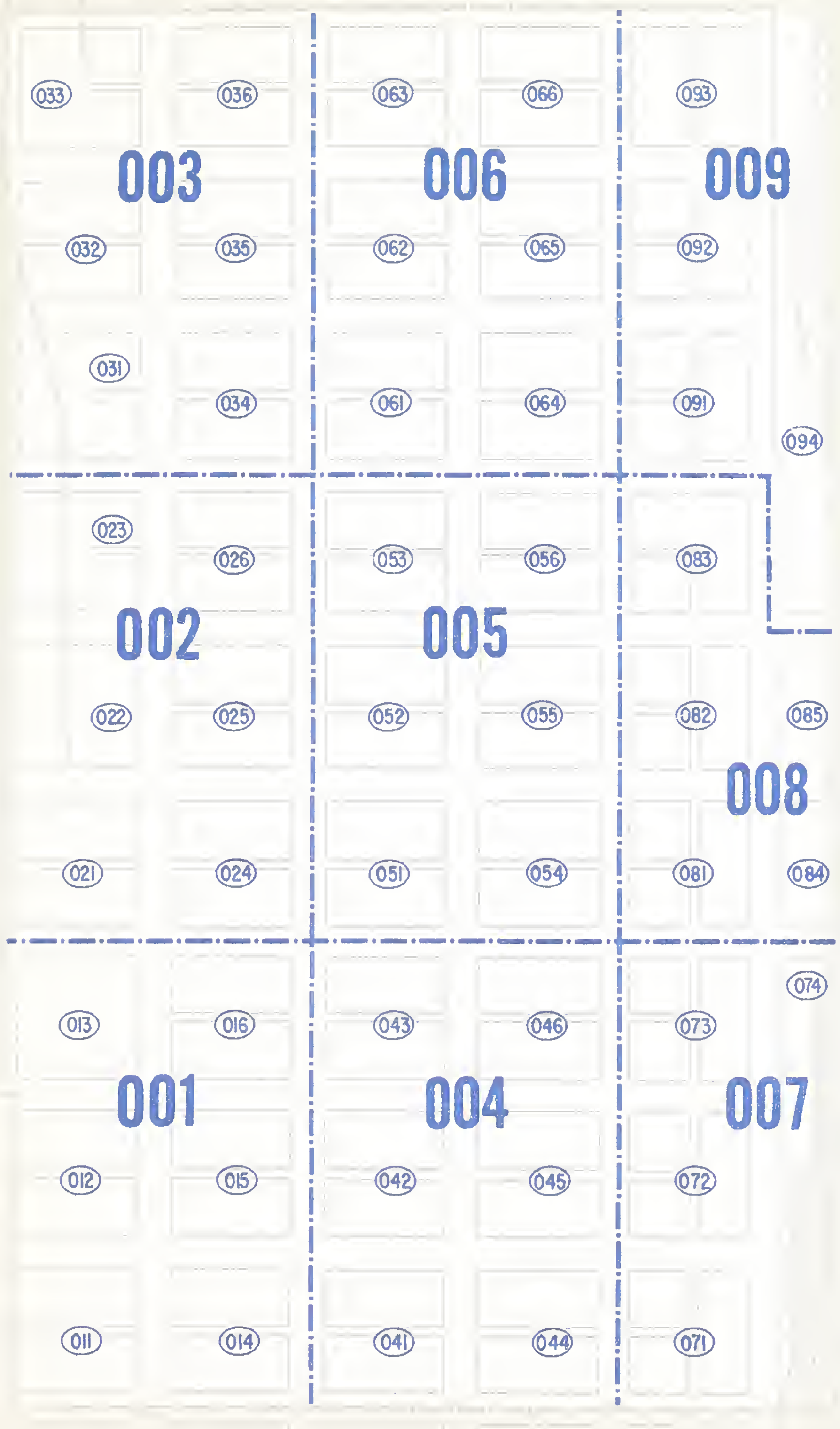
Table F-2

KIND OF PARKING RELATED TO PURPOSE OF TRIP FOR INTERNAL AUTO DRIVER TRIPS WITH DESTINATIONS IN THE CENTRAL BUSINESS DISTRICT

	Trip Purpose									
Kind of Parking	Work	Personal Business	Medical-Dental	School	Social-Recreation	Change Mode of Travel	Eat Meal	Shopping	Serve Passenger	Home	Total
Street Free	1,115	955	10	29	633		150	490	705	135	4,222
Street Meter	778	1,528	139		236		323	1,599	362	13	4,978
Lot Free	2,133	964		30	138		146	686	128	41	4,266
Lot Paid	1,027	206	60	10	90		68	384	59	10	1,914
Garage Free	68	10			19		10				107
Garage Paid	42	10	10		29		29	127			247
Service or Repairs								39	10	16	65
Residential Property	49	39		10	30		21	9	10	250	418
Cruised	24	19			92			20	29		184
Not Parked	116	323	9		127		10	19	2,754	16	3,374
Total	5,352	4,054	228	79	1,394	0	757	3,373	4,057	481	19,775

EXHIBITS

EXHIBIT I

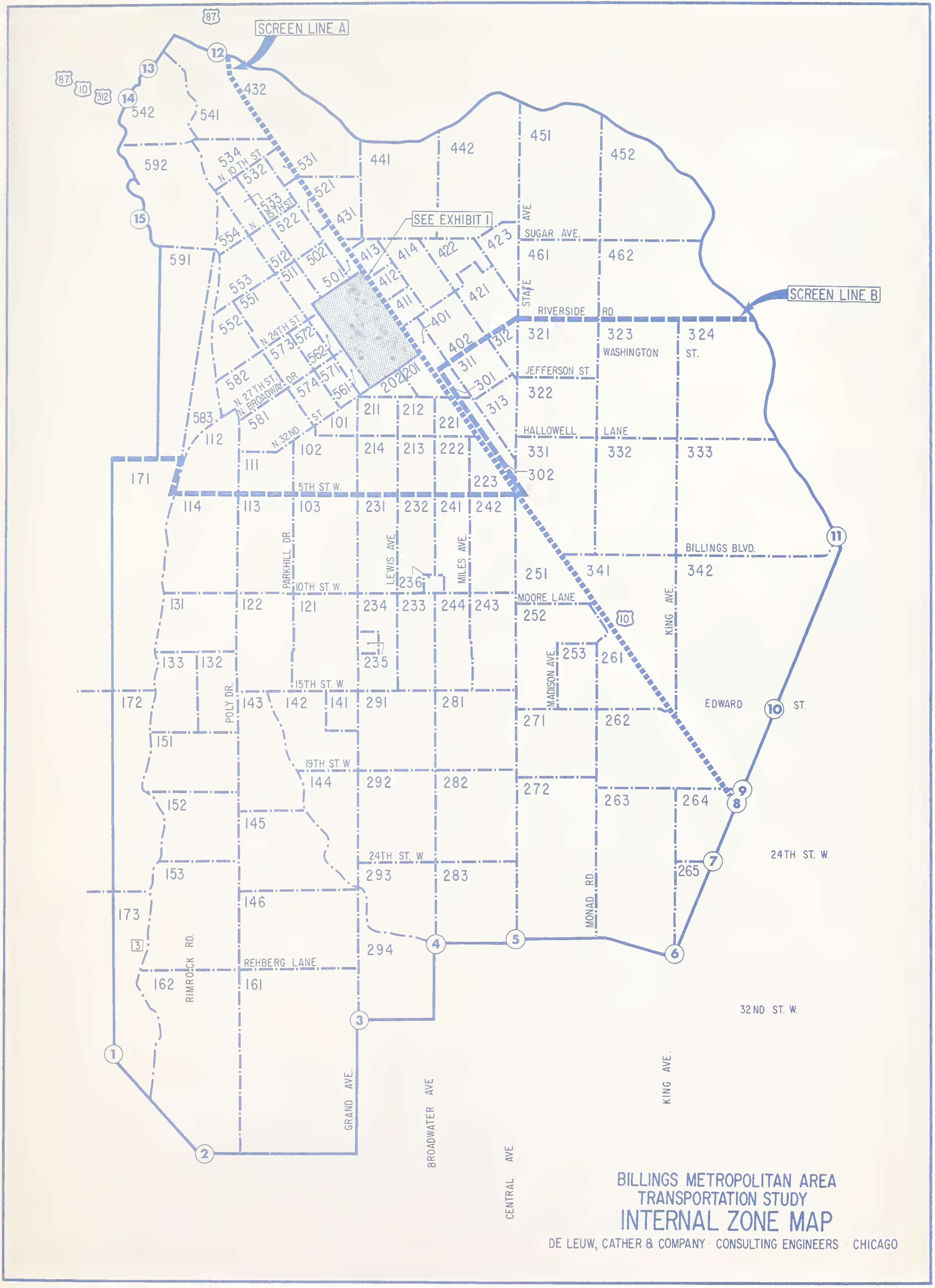


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

CENTRAL BUSINESS DISTRICT BLOCK AND ZONE MAP

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

EXHIBIT 2

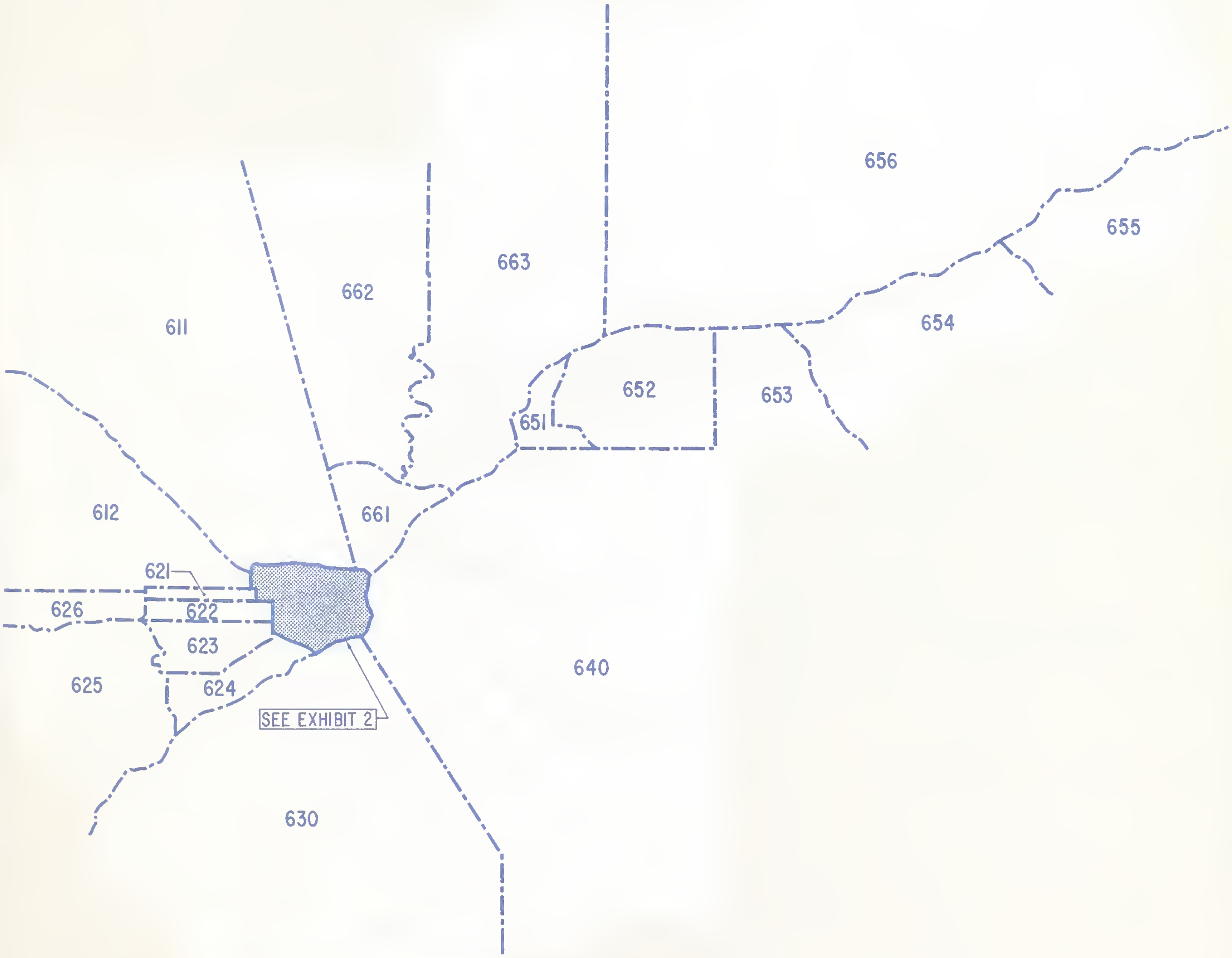


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

INTERNAL ZONE MAP

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

EXHIBIT 3

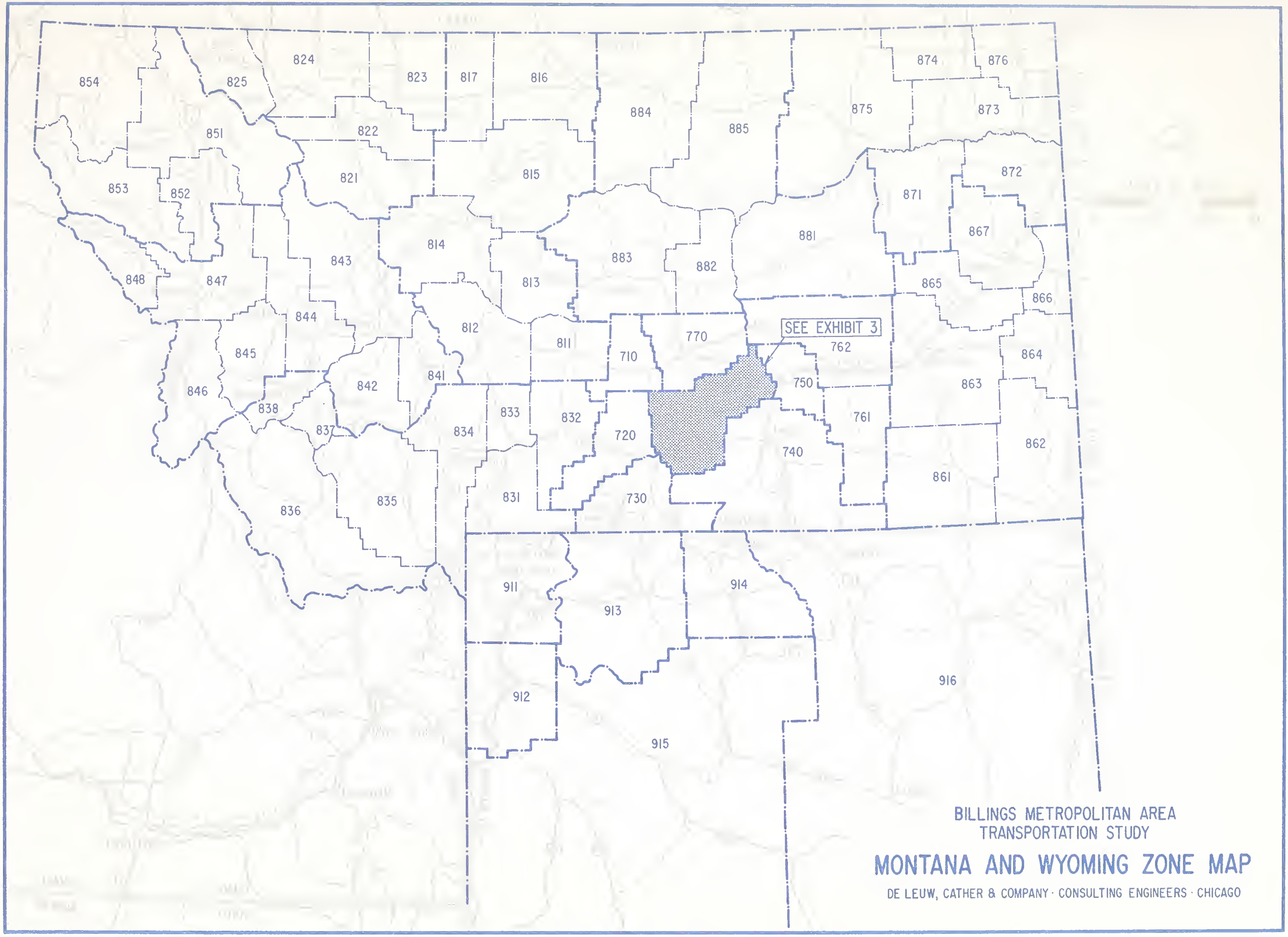


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

YELLOWSTONE COUNTY ZONE MAP

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

EXHIBIT 4



BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

MONTANA AND WYOMING ZONE MAP

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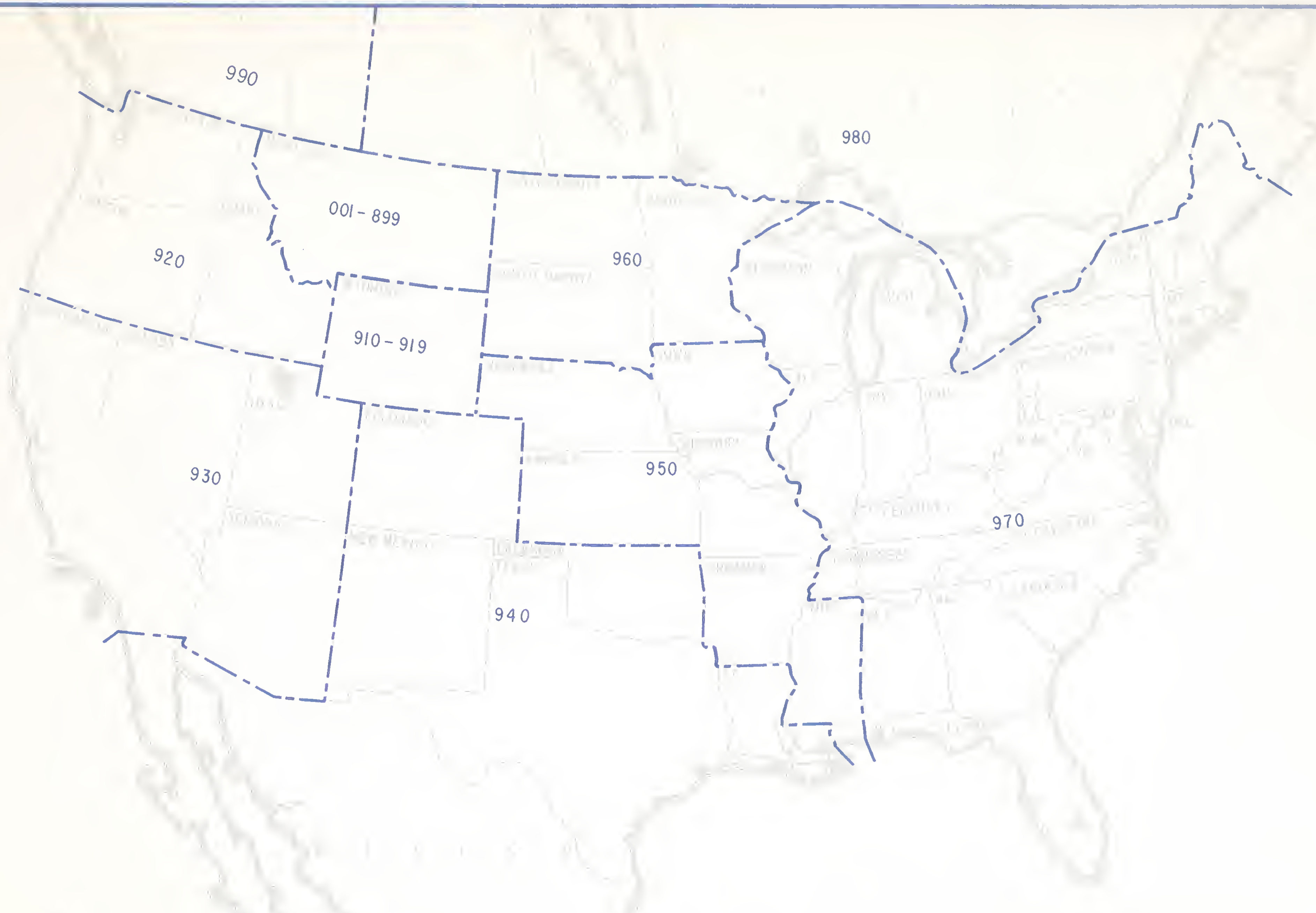
EXHIBIT 5

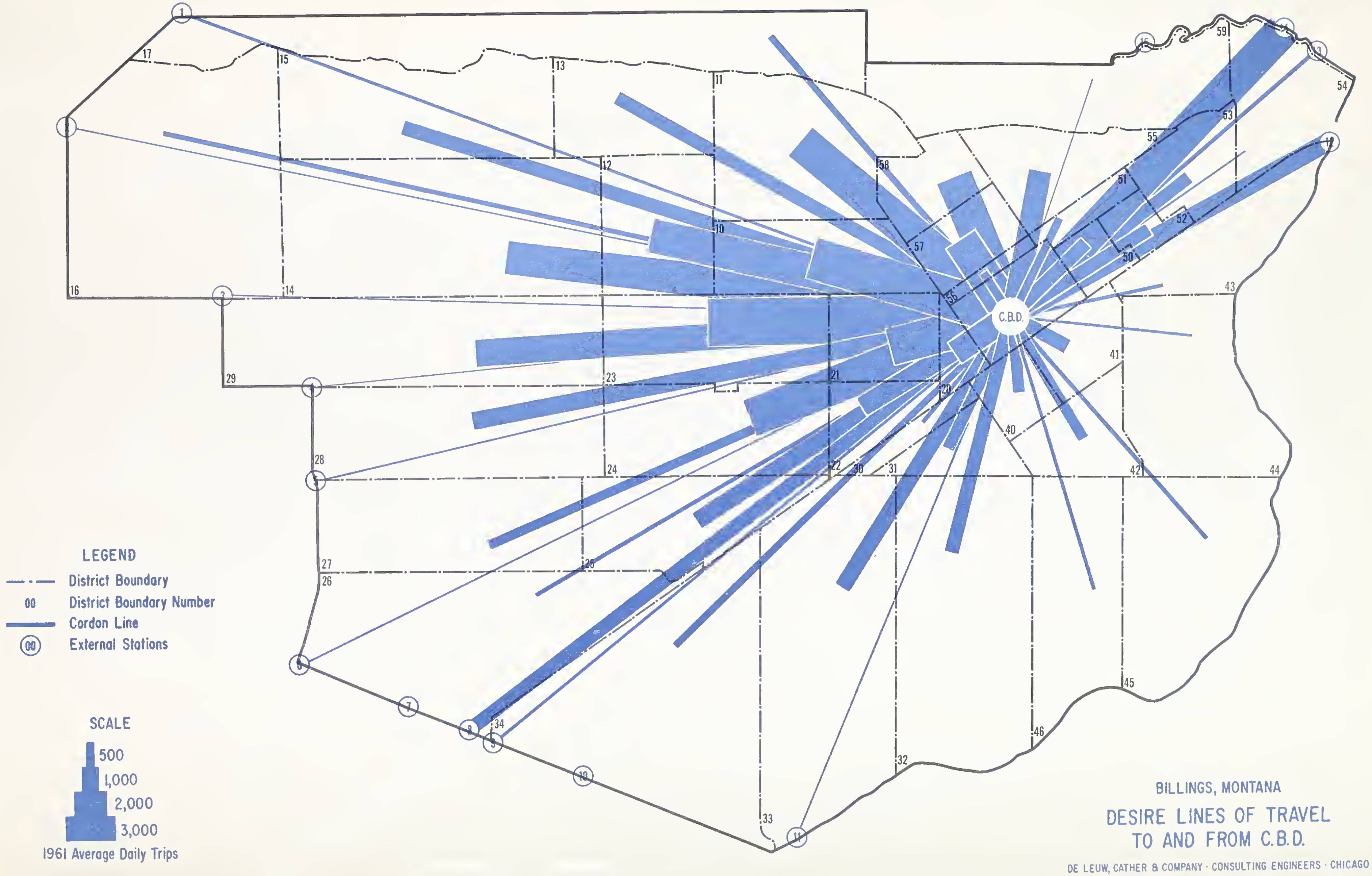


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

UNITED STATES ZONE MAP

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

EXHIBIT 6

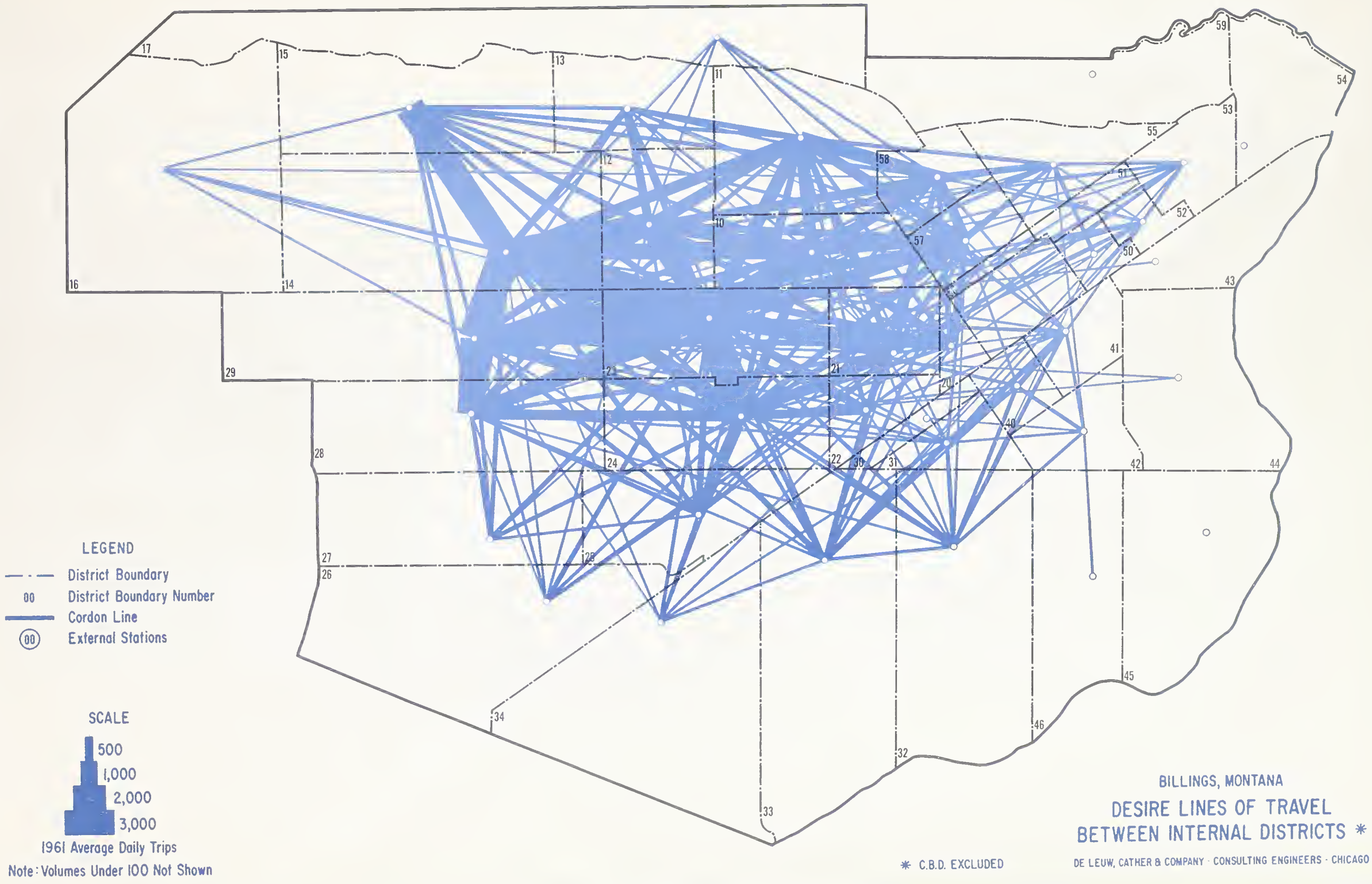


BILLINGS, MONTANA

DESIRE LINES OF TRAVEL TO AND FROM C.B.D.

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

EXHIBIT 7



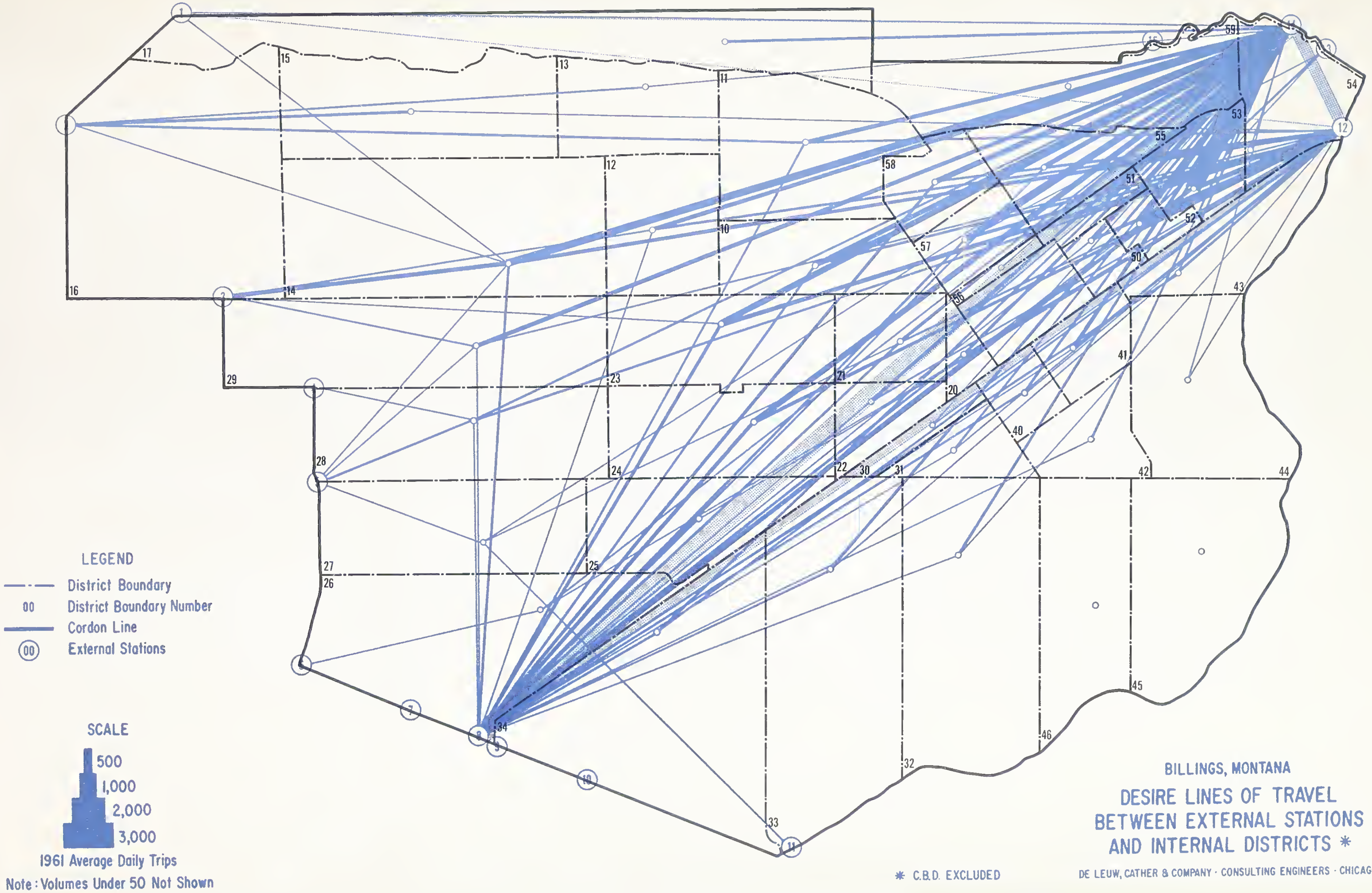
BILLINGS, MONTANA

DESIRE LINES OF TRAVEL BETWEEN INTERNAL DISTRICTS *

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

* C.B.D. EXCLUDED

EXHIBIT 8



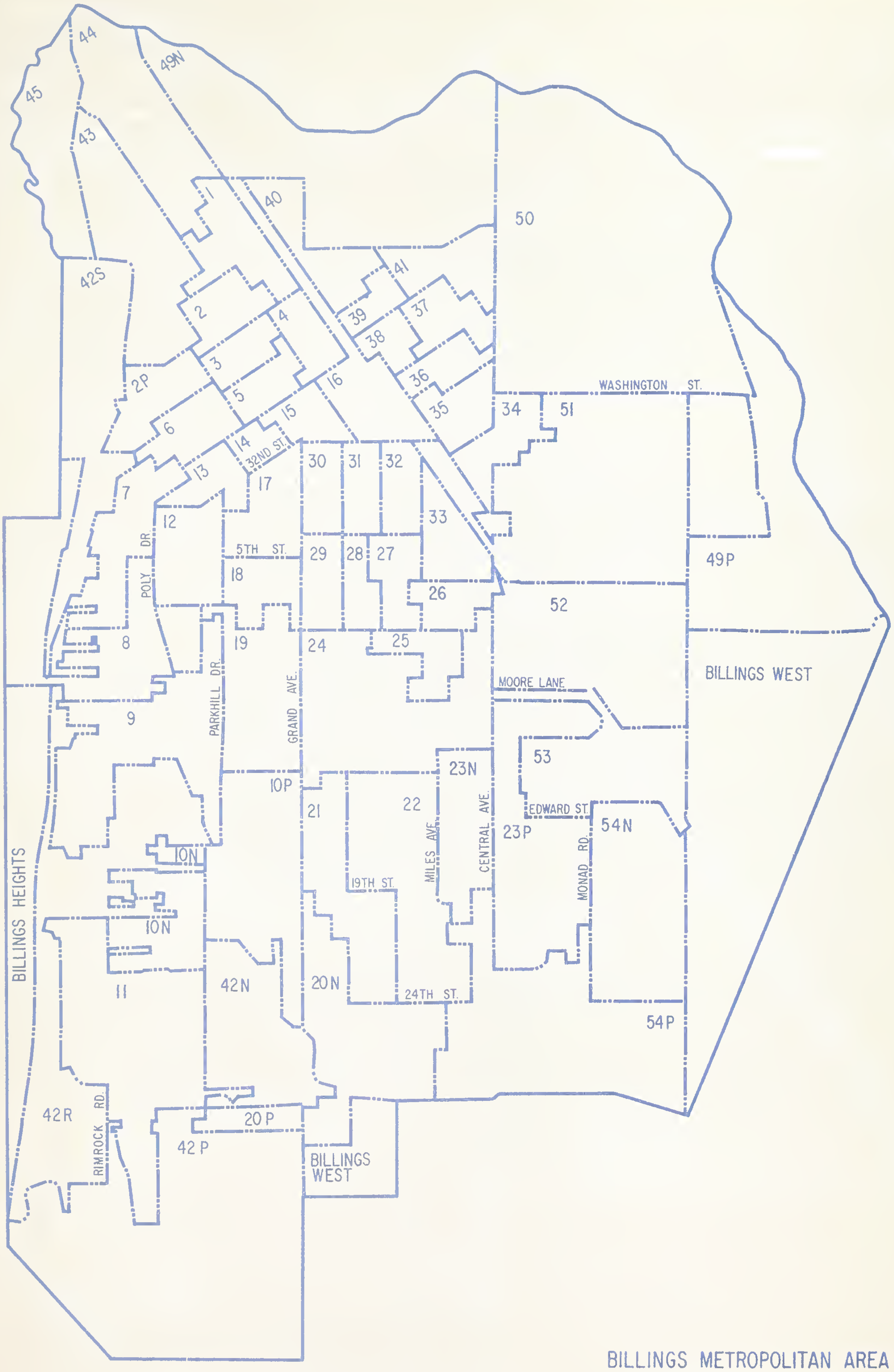
BILLINGS, MONTANA

DESIRE LINES OF TRAVEL BETWEEN EXTERNAL STATIONS AND INTERNAL DISTRICTS *

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

* C.B.D. EXCLUDED

EXHIBIT 9

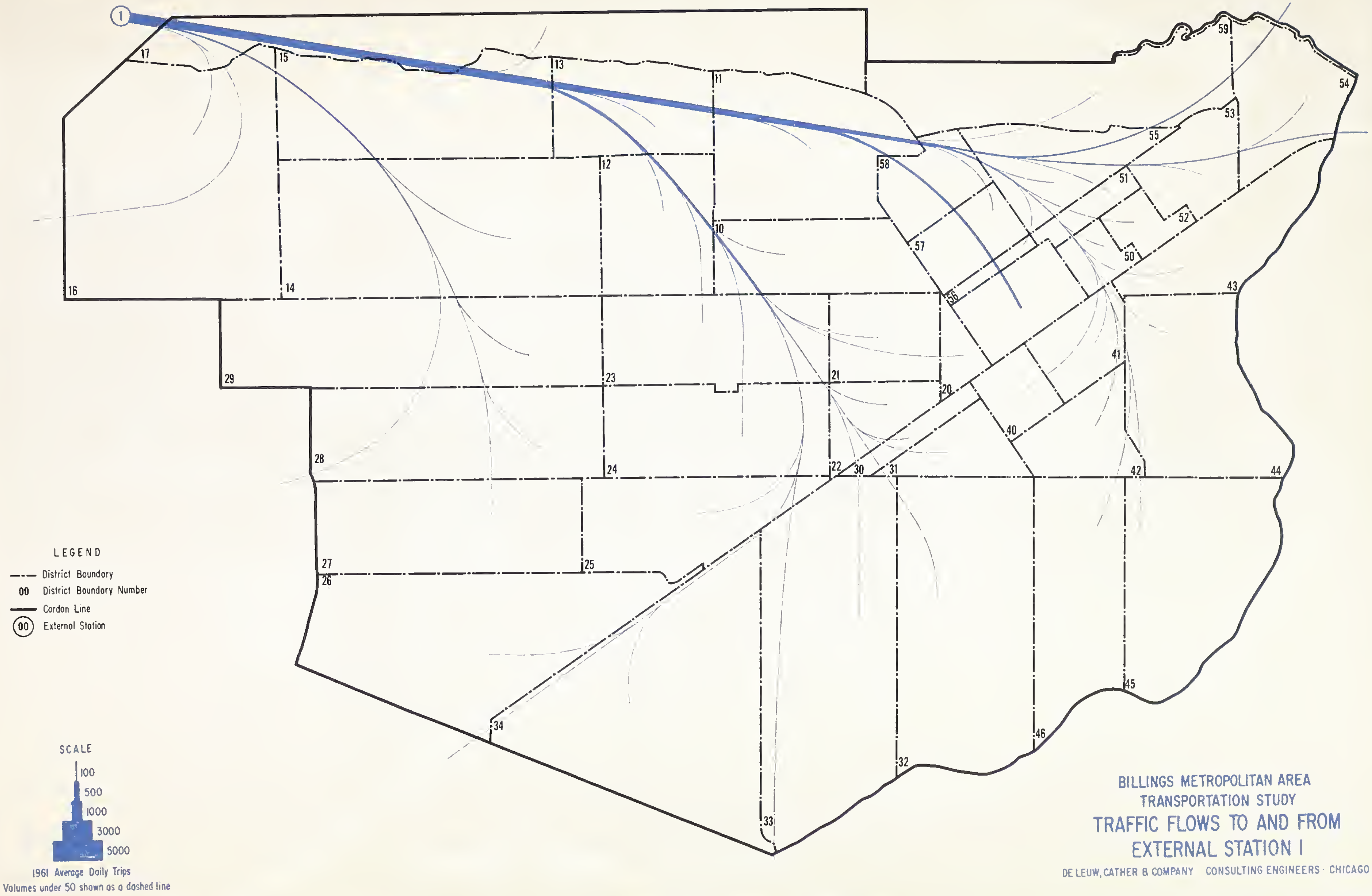


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

ENUMERATION DISTRICTS

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

EXHIBIT 10

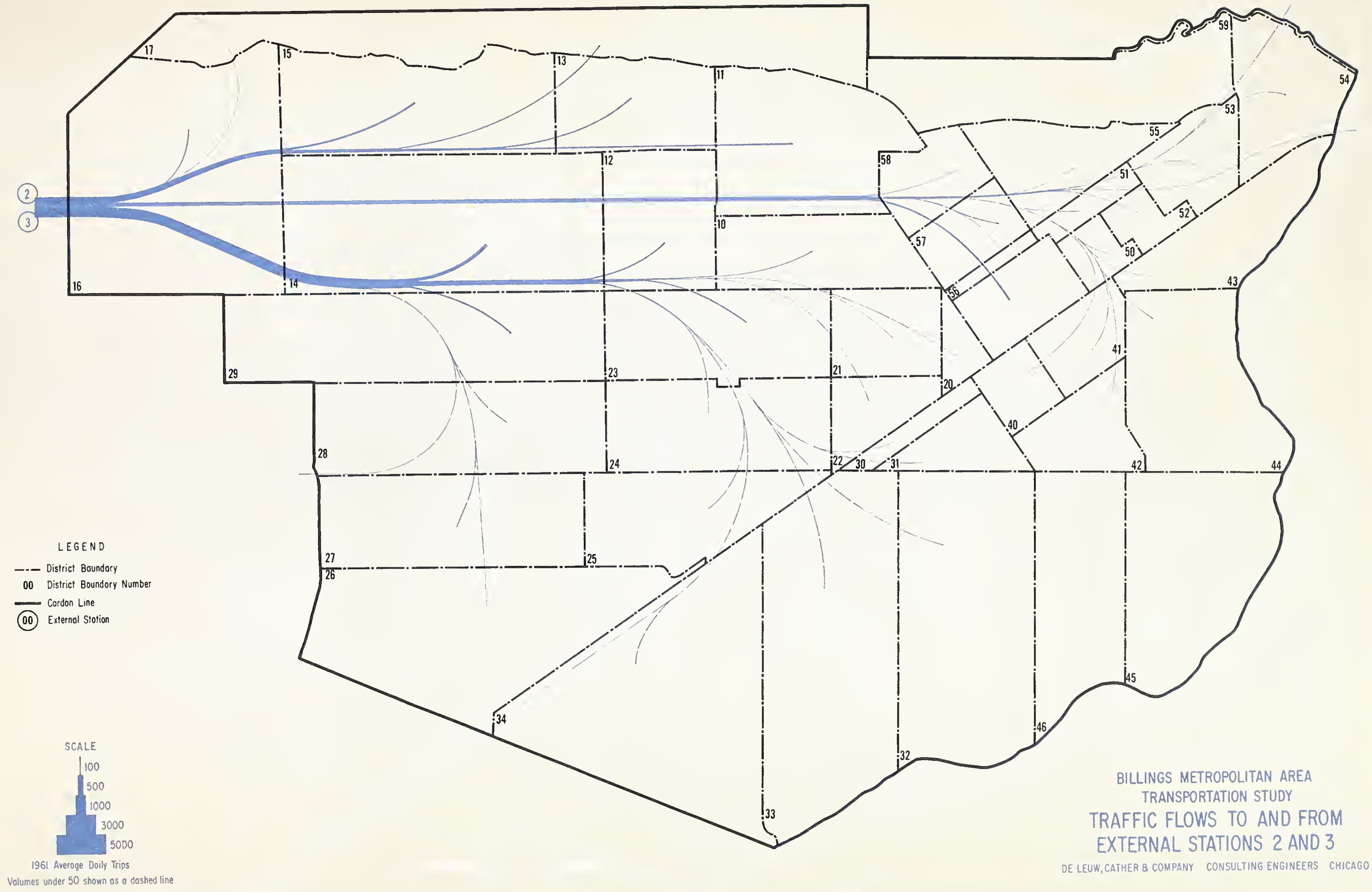


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

TRAFFIC FLOWS TO AND FROM EXTERNAL STATION I

DE LEUW, CATHER & COMPANY CONSULTING ENGINEERS · CHICAGO

EXHIBIT 11

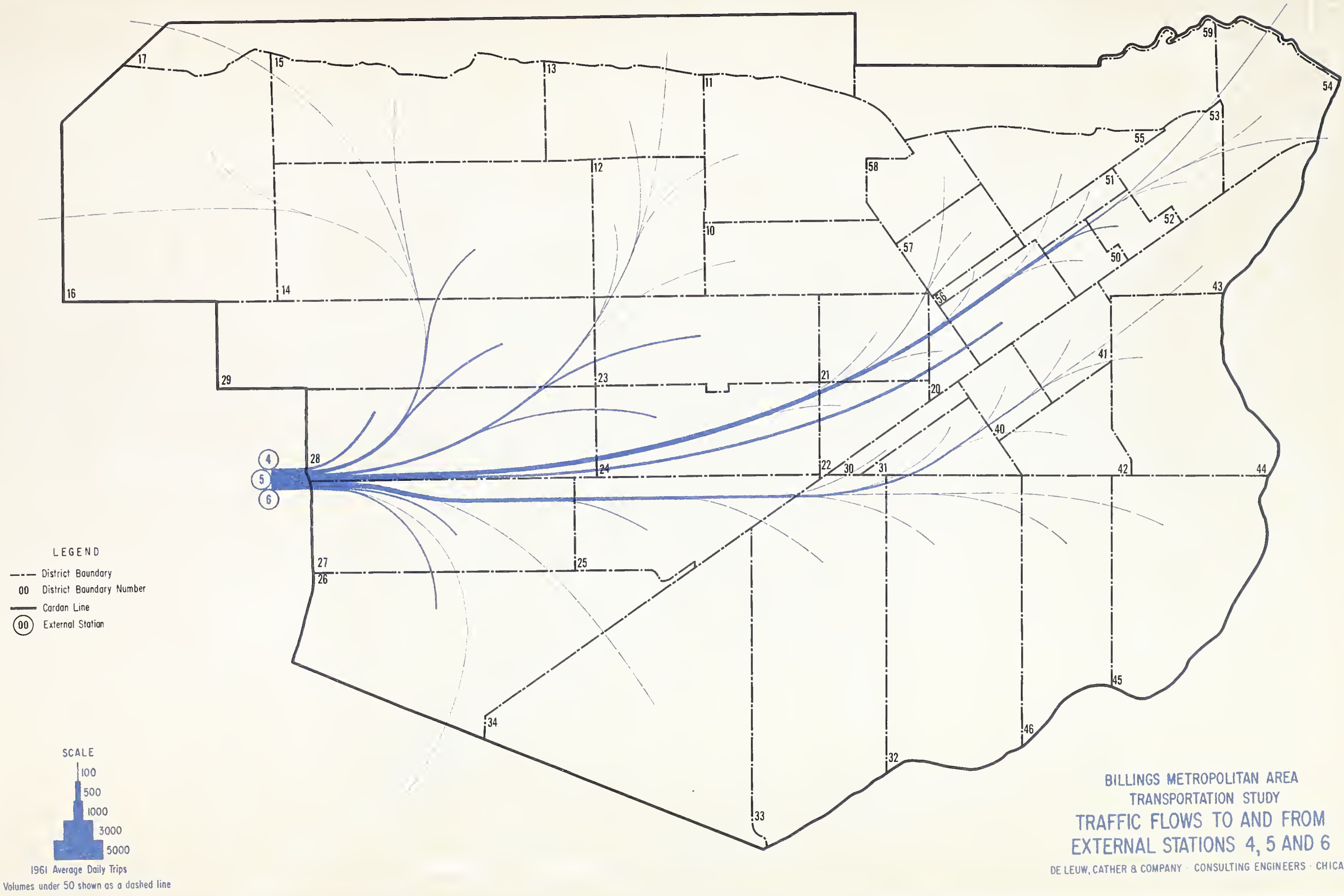


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

TRAFFIC FLOWS TO AND FROM EXTERNAL STATIONS 2 AND 3

DE LEUW, CATHER & COMPANY CONSULTING ENGINEERS CHICAGO

EXHIBIT 12



BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

TRAFFIC FLOWS TO AND FROM EXTERNAL STATIONS 4, 5 AND 6

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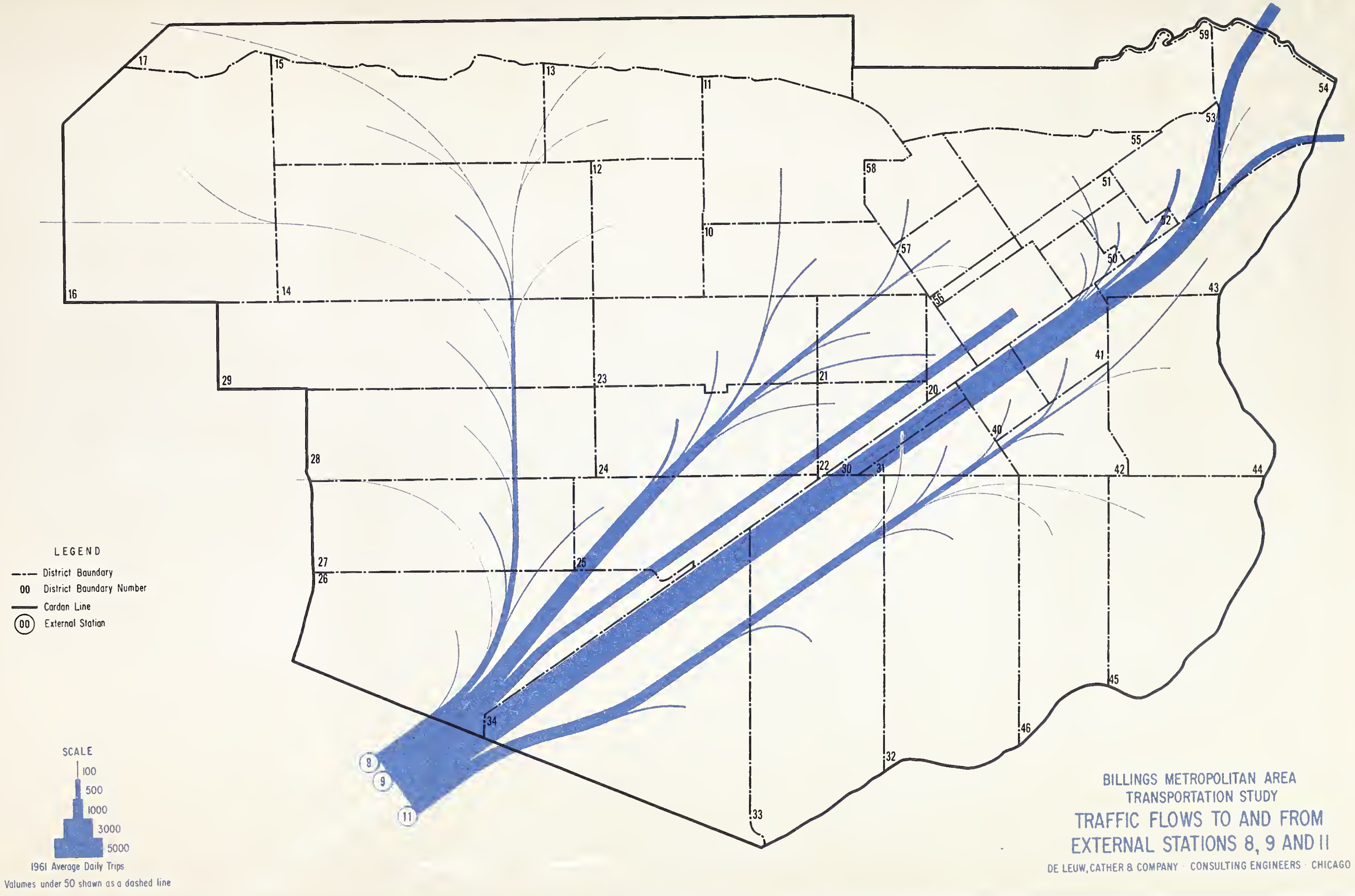
EXHIBIT 13



BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

TRAFFIC FLOWS TO AND FROM EXTERNAL STATIONS 8, 9 AND 11

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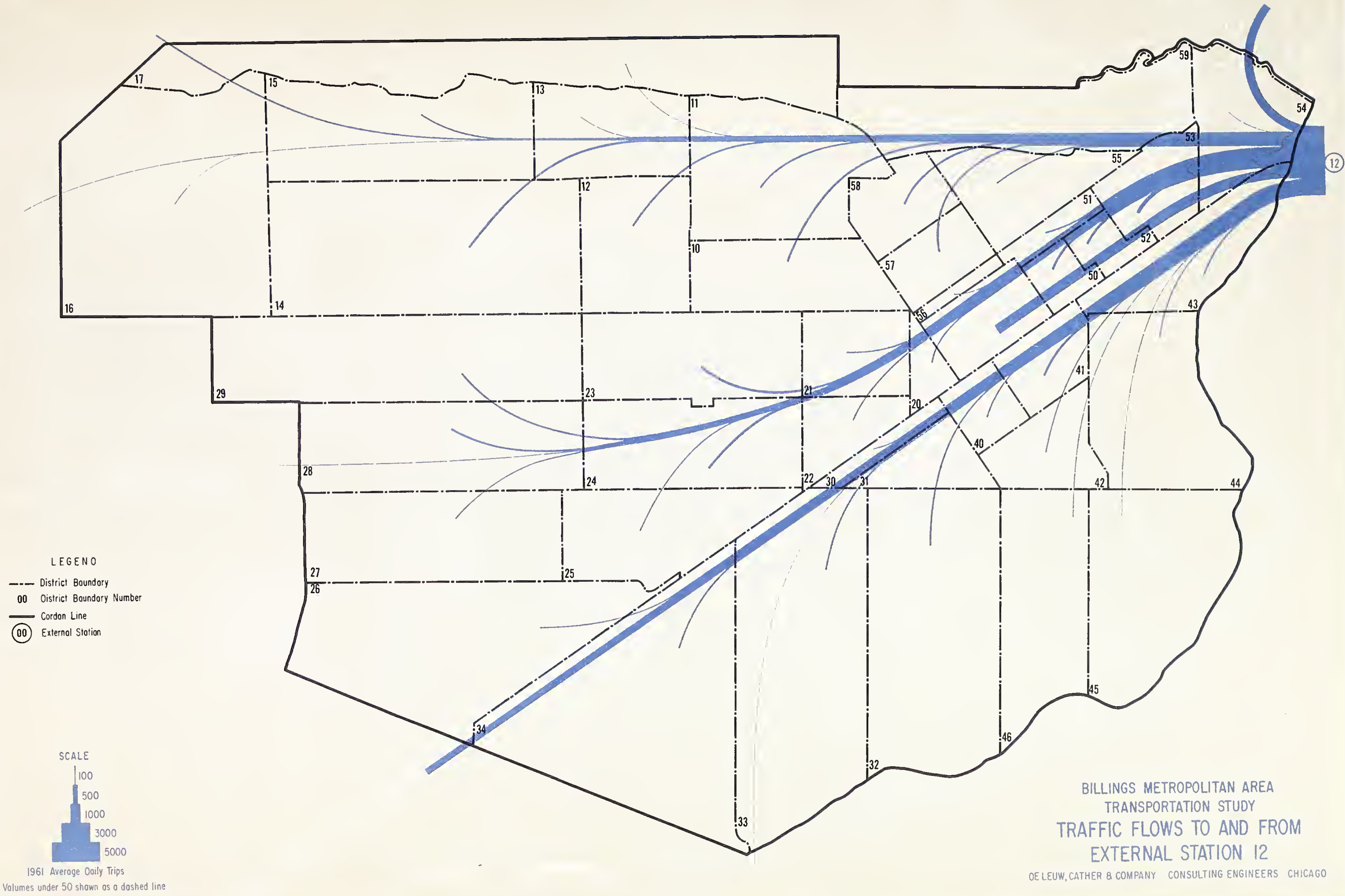
EXHIBIT 14

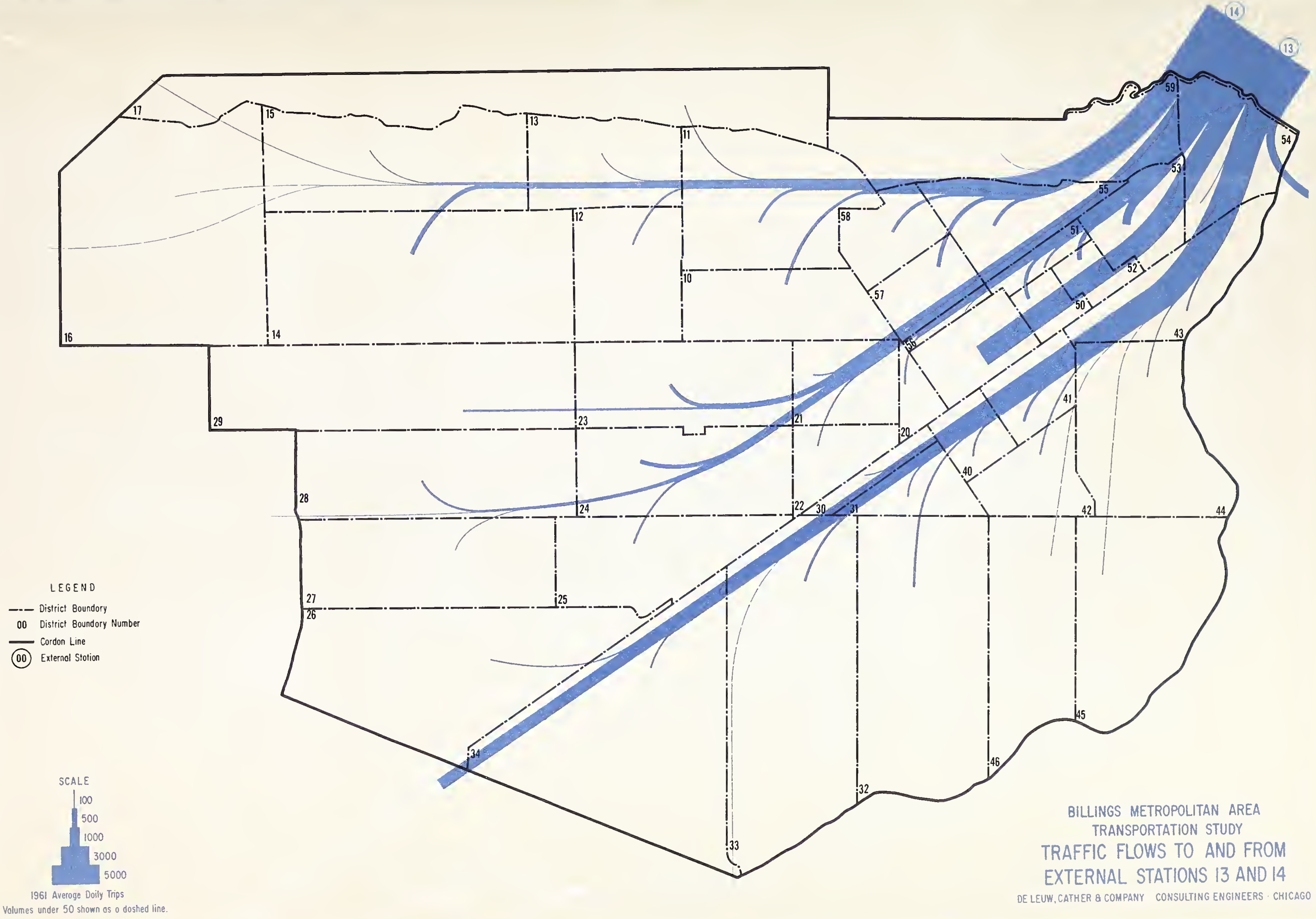


BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

TRAFFIC FLOWS TO AND FROM EXTERNAL STATION 12

DE LEUW, CATHER & COMPANY CONSULTING ENGINEERS CHICAGO

EXHIBIT 15



BILLINGS METROPOLITAN AREA
TRANSPORTATION STUDY

TRAFFIC FLOWS TO AND FROM EXTERNAL STATIONS 13 AND 14

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BUS PASSENGER TRIPS — AVERAGE DAY 1961 - INTERNAL

TABLE C-4 (1961)

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AUTO, TRUCK AND TAXI PASSENGER TRIPS – AVERAGE DAY 1961 – INTERNAL

TABLE C-3(1961)

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

AUTO AND TAXI DRIVER TRIPS – AVERAGE DAY 1961 – INTERNAL AND EXTERNAL

TABLE C-2 (1961)

[illegible]

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

TRUCK DRIVER TRIPS – AVERAGE DAY 1961 – INTERNAL AND EXTERNAL

TABLE D-1(1961)

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TOTAL PERSON TRIPS – AVERAGE DAY 1961 – INTERNAL

TABLE C-1(1961)

DE LEUW, CATHER & COMPANY · CONSULTING ENGINEERS · CHICAGO

TOTAL VEHICLE TRIPS — AVERAGE DAY 1961—INTERNAL AND EXTERNAL

TABLE E-1(1961)

[illegible]

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